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NewTekNIQUES

September/October 2000
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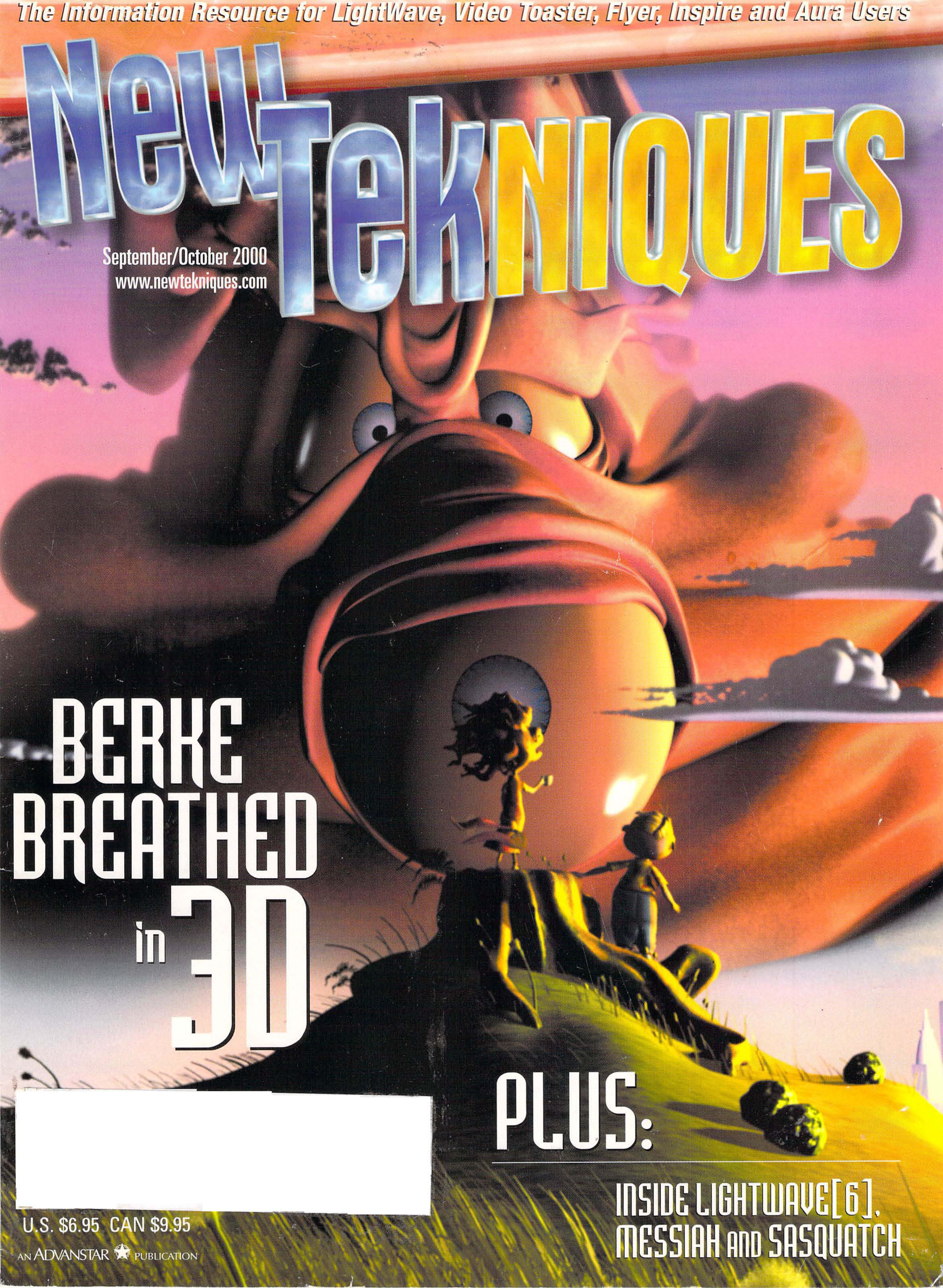

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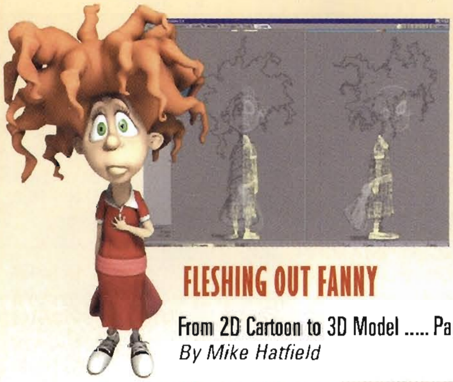

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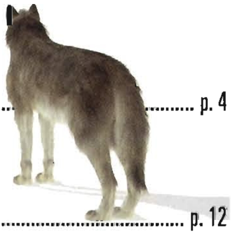

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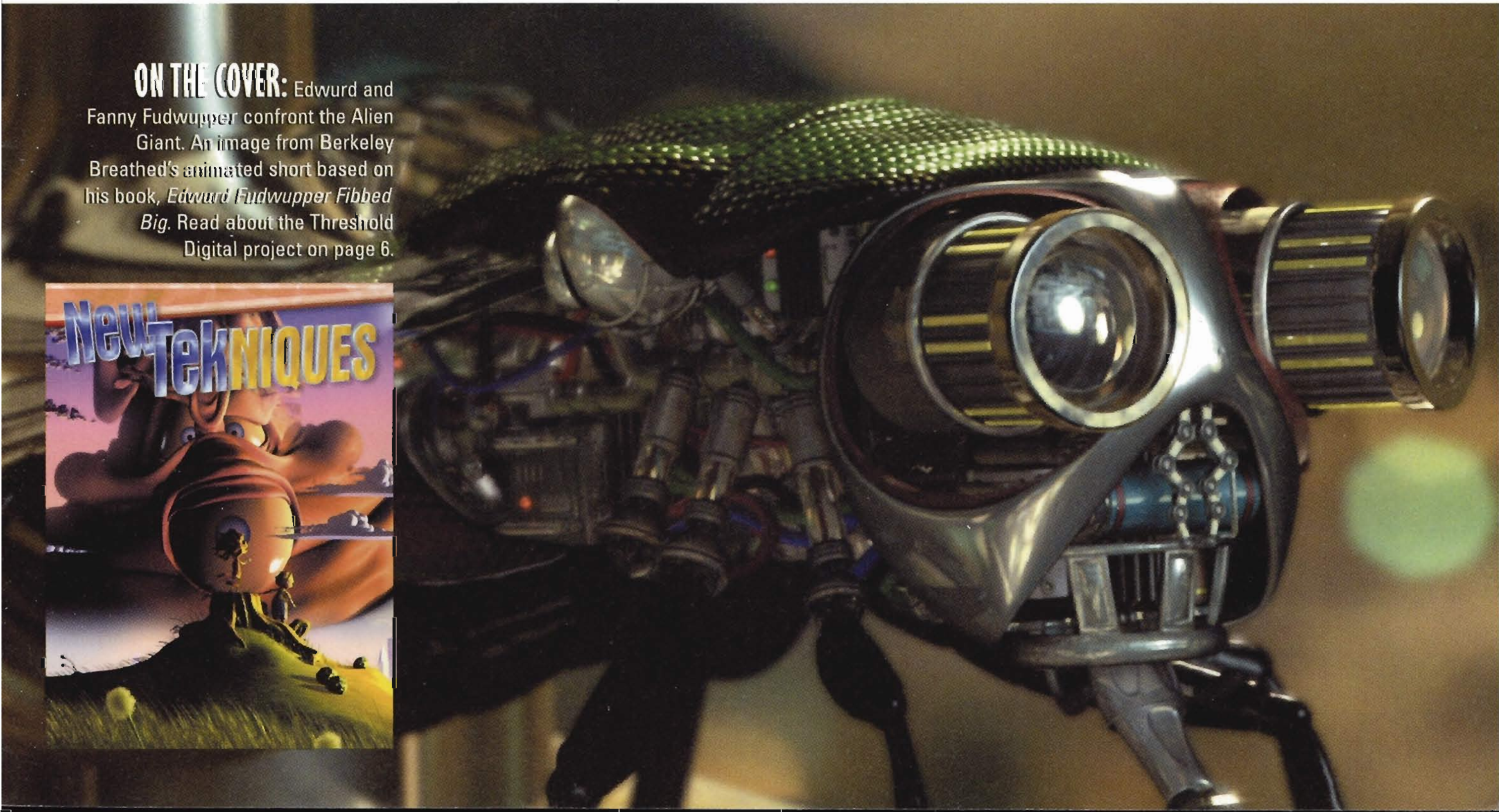

ON THE COVER: Edwurd and Fanny Fudwupper confront the Alien Giant. An image from Berkeley Breathed's animated short based on his book, *Edwurd Fudwupper Fibbed Big*. Read about the Threshold Digital project on page 6.

Impressions

A FEW WORDS FROM OUR EDITORS-IN CHIEF

by Molly Dinkins
& Dick De Jong

Some Like It Hot

Thanks to a visit at Threshold Entertainment on a cool cloudy day in L.A., we were able to escape the intense heat wave that barbecued Texas this summer. Out West, we looked into the work of a couple of Austin cult heroes. We found out why director Robert Rodriguez overlooked local animators at Digital Anvil - they were busy attempting to launch the movie, *Wing Commander*, and we learned a good reason why UT grad Berkeley Breathed morphed his successful acid political cartoons into classic kid's lit - he's a new dad.

Down the hot dusty trail to San Antonio, Tim Jenison ponders the future of bandwidth. (Are we looking at the fountainhead to his next innovative splash in the Internet ocean?) Speaking of oceans, congratulations to Foundation Imaging alumnus Jeff Scheetz who traded one coast for the other and has started up a LightWave school in Universal City, Florida.

Defense Witness

Mojo, meanwhile, straddles the continent giving an L.A perspective on a New York Court case with international implications. In the spirit of full disclosure, Mojo is good friends with one of the defendants in the case, Emmanuel Goldman, the publisher of *2600, The Hacker Quarterly*. That fact doesn't lessen the gravity of the case and the far reaching repercussions of Judge Kaplan's ruling. The verdicts from this DVD trial and the Napster judgement are setting legal precedents that may impact us for decades to come.

Read Tim Jenison's vision of our broadening bandwidth prospects and you will realize that the landscape in which we learn and earn is experiencing tectonic shifts. As citizens in this burgeoning brave new digital world, we need to be informed about the decisions that are determining how we will work and play in our not too distant future.

You may not agree with Mojo or Goldman's views; but as digital content creators the time has come to prick up your ears and become involved in the dialogue. Go to 2600.com and read about the DVD case. On our website, www.newtekniques.com, Bob Ketchum has offered his perspective as a musician on the Napster controversy. For our part, as a magazine and a website, we will continue monitoring these issues and contributing to the discourses.

Dan Ablan and Friends

We have been hearing rave reviews, from CG artists to college instructors, about Dan Ablan's new book, *Inside LightWave [6]*, so we were delighted to publishan excerpt from the tutorial-teeming tome in the past issue of *NewTekniques*. Ablan wrote to remind us that he was not solely responsible for the book. He explains that "although I've developed and rewritten most of them, 6 of the 21 chapters were contributed." In fact, the excerpt on modeling eyes was written by Stuart Aitken, who contributed the head tutorial to Ablan's book. We are happy to give Stuart his deserved recognition.

Let It Snow . . .

So we have covered global warming, hot sex on the *Scary Movie* screen, and a heated debate about our electronic freedoms.

Next issue, weather permitting, we will cover cool commercials. nT

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TEKTICKER Keeps on Ticking

www.newtekniques.com/TekTicker

The popular TekTicker is back with news items and links about a wide range of topics. Now written by Jim Cullers, check TekTicker out regularly.

NEW ART GALLERY

www.newtekniques.com/ArtGallery/

The NewTekniques Art Gallery continues to collect work from artists from around the globe.

"Sextant" by Fred Gunnerson.

COLUMNS

The Idea Factory: Bob Ketchum offers more tips for the independent videographer.

Aura Essentials: Steve Bowie has created an exciting Aura Online department filled with tutorials, downloads, and Aura goodies.

Hear Ye! Hear Ye! - Bob Ketchum, the King of Rock and Rocking Chairs, shares his many, many years of audio production experience.

LightWave Fundamentals: Happy Halloween - Just in time for the holiday, Jared Brookes shows you how to make a LightWave Jack-o-lantern.

Visions

FROM THE PAST, FOR THE PRESENT, AND INTO THE FUTURE

THE DEATH OF VIDEOTAPE

The Birth of Bandwidth

by
Tim Jenison

With Internet bandwidth tripling every year, very soon web video-on-demand will replace your corner video rental store. Almost any movie or TV show ever made will be available online - bad news for the video rental business. I, for one, won't miss them. You wouldn't believe the late charges my family runs up!

Email has largely displaced the first class letter. MP3 is on the verge of supplanting the compact disc. The next step on the web's bandwidth ladder is broadcast-quality video, and then film-resolution HDTV. For those of you who are still snoozing with a phone modem, you may find this hyper speed hard to believe. But with Internet bandwidth on an exponential growth curve steeper than Moore's Law, expect fast and furious changes. Soon, the ubiquitous VHS cassette will be extinct.

But what about the world of video production? We'll always have videotape right? Fortunately, not. Consider some of videotape's drawbacks.

First, broadcast tape cassettes are expensive - very high profit margin "razor blades" for the manufacturers. (Though they don't really give away the "razors," either.), And how about those tape heads? How do they make them wear out so fast? Don't you love dropouts? Creases? Eaten tapes? Head clogs? Accidental erasures? Broken cassette housings?

How much of your life has been spent rewinding and fast-forwarding, looking for that good take? Disk-based nonlinear editing has made life much easier, or course; but you still have to laboriously log and digitize your source videotapes. But, won't we always acquire our footage on tape or film? How will the Internet change this?

Here's how: soon, Internet bandwidth will be able to keep up with live video. And the Internet is going wireless. Unlike videotapes, computer disk storage costs are declining rapidly. These factors taken together sound the death knell of videotape and even film. The camcorder of the future will not have a tape slot, but an antenna. Material acquired in the field will be transferred instantly and wirelessly to central servers, where the producer can view the material and immediately begin editing. The client watches the rough edit minutes later, halfway around the world, if necessary.

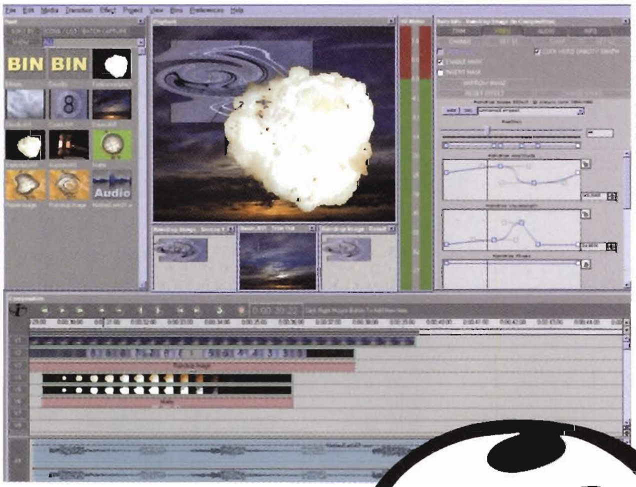
You'll be able to search and watch any video you've ever produced - any time, anywhere. Password protection and encryption will keep it private, if you desire. Geographically separated servers will automatically store and back up archives. Videotape? Who needs it?

After you've created your masterpiece, you can deliver it directly to the viewer with no middleman. His rental fee goes straight from his credit card to your account. No "powers that be" to take a percentage or muddy the message. Just you and your viewers. Now, how cool is that?

New & Retooled

Speed Razor 2000 and 2000 X

In-Sync is shipping two new versions of **Speed Razor: 2000 and 2000X**. Both products have the following new features: a faster render engine, a new bounding box that encompasses all of SR windows, smoother scrubbing on the timeline with automatic compensation for audio drift, scrubbing and trimming long clips, an expanded toolbar with customizable 32 bit icons, a larger time-code display, more room for text buttons, streamlined zoom controls for navigating the timeline, improved support for setting up dual monitors, deeper control of key frames on effects graphs and improved bin organization. They both support Windows 2000, NT, and 98.



Speed Razor 2000X is designed for long form editors that wish to work on projects with large numbers of clips and has the following extra features: multiple bin/sub-bin support that can combine search and bins to get the best of a flat and hierarchical sorting system; a batch capture to bin that allows each bin to generate its own batch capture list and add to the master batch capture list; a fully customizable keyboard so you can map every function to any key; and QuickTime support with Sorenson Codec.

The price for 2000 is $895 and $200 for an upgrade from 4.x. The MSRP for 2000X is $2,000 with upgrade information at www.in-sync.com.

Sasquatch

Worley Laboratories has introduced **Sasquatch**, a new hair, fur, and grass system for LightWave 5 and 6. The long-awaited plugin features fast rendering of millions of hairs directly in LightWave. Innovative features include manual or automatic combing, surface or texture based placement, extensive styling controls, an interactive preview, wind and dynamics, and a fast multithreading rendering engine. The software is currently shipping after an extensive cooperative development period with Hollywood studios.

Full feature descriptions and an extensive collection of examples can be found at http://www.worley.com/ sasquatch/sasquatch.html. The plugin is priced at $499.

Adobe Premiere meets VideoToasterNT

New from Bob Tasa - the **RTV File I/O** plugins for Premiere allow the VideoToasterNT to be used with Adobe Premiere's editing software.

Features include the following: support for PAL or NTSC video, realtime timeline playback of cuts only video, capture of RTV from inside Premiere, playback of slow-motion and fast-motion video, and automatic deinterlace to make CD-ROM video creation a breeze!

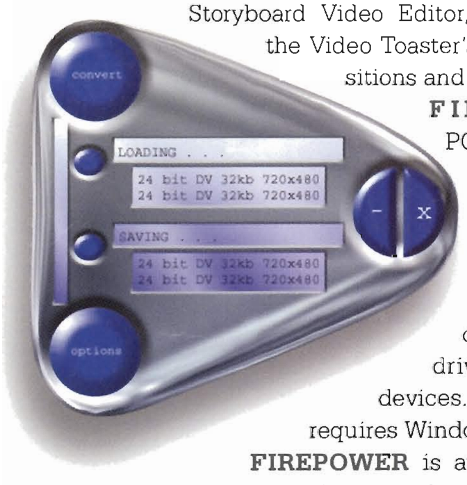
The plugins enable you to import the uncompromised video quality of the VideoToasterNT into Adobe Premiere's excellent three-point editing system and apply all of Premiere's third-party software. The retail price of Tasa's plugins is $79.95 until October 31st.

For further information contact www.sharbor.com or call 1-800-544-6599.

FIREPOWER - DV for the Video Toaster

Exodus Multimedia announces **FIREPOWER** – the first and only DV interface for the Video Toaster. **FIREPOWER** gives Video Toaster users plug-and-play ability to capture and edit DV in its native format via FireWire.

FIREPOWER enables Speed Razor, Aura and LightWave to directly import DV via its MMX-optimized DV codec as a standard Windows AVI file. FIREPOWER comes complete with capture and playback software that controls industry-standard DV cameras or video decks. **FIREPOWER** also includes a pre-release version of the Storyboard Video Editor, which utilizes the Video Toaster's real-time transitions and CG.



FIREPOWER's PCI card has two external and one internal FireWire ports and accepts most FireWire cameras, hard drives and other devices. **FIREPOWER** requires Windows 2000.

FIREPOWER is available directly from Exodus Multimedia for an introductory offer of $495 and will retail for $795. For further information, 888-3EXODUS or www.exodusmm.com.

Vidget from NewTek

NewTek announces **Vidget**, an advanced tool that encodes and converts both video and audio. Especially useful for applications such as Internet streaming, DVD or CD-ROM creation, high definition encoding, web content creation and multimedia production, **Vidget** creates the highest quality stream possible at the lowest possible bit-rate.

Vidget includes comprehensive support for all major video and audio formats, including MPEG I, MPEG II, QuickTime, AVI and RTV in NTSC, PAL, 16:9 wide-screen or High Definition MPEG II. All major still graphic formats are supported.

Vidget will be available for download from www.newtek.com. The still image version is free and the complete version is $99.

Video Tutorial - Sasquatch, First Sighting

Creative Imagineering, Inc. has released **Sasquatch, First Sighting**, a companion video to **Sasquatch**, the Worley Labs innovative new hair/fur plugin. Jack "Deuce" Bennett II hosts the tape. In-depth coverage is given to Sasquatch's extensive interface by using time-lapse video progressions demonstrating just how each control option works. 3D artists who have purchased the tape call it an "animated manual" and "a must have." Steve Worley himself says "I can give it my honest 'Thumbs up" recommendation".

SASQUATCH
FIRST SIGHTING

Sasquatch, First Sighting is available at www.cimagineering.com in NTSC and PAL for $45.00 plus shipping. A Japanese translation is currently in the works.

The DAVE School

Former Foundation Imaging Visual Effects Supervisor and Recruiter Jeff Scheetz announces the opening of **The Digital Animation & Visual Effects (DAVE) School** at Universal Studios Florida.

DAVE SCHOOL

It features a motion capture stage, 20-seat computer lab, and use of the soundstages and backlots at Universal's Orlando Studio. Each student's workstation is equipped with Toaster NT, LightWave, and Aura, as well as AfterEffects, and Photoshop.

Working with several effects and animation companies, Scheetz designed the school's one-year associates degree program to address the specific needs of the Hollywood LightWave community. "We made a list of what employers want from our applicants and worked backwards." For more information visit www.DaveSchool.com.

Snapshot TNT

Snapshot automates the task of grabbing still photos to make Toaster RTV Stills or RTV sequences. It includes a modified keyboard with foot controls. The foot pedal controller allows hands-free operation so you easily can adjust the camera and change the position of photos or models. The user need not touch the keyboard or mouse until finished with digitizing. Snapshot automatically names the RTV stills or sequences in the order they are grabbed. Also, a dynamic time lapse capture lets you set a beginning and ending interval, allowing you to speed up or slow down captures over time.

The price is $79.95 for the single pedal version and $99.95 for the dual pedal version. Order direct from 1-800-379-7267 or visit www.dvsdirect.com/snapntnts.htm.

Threshold Digitalis

An Elixir for VFX

by Molly Dinkins & Dick De Jong

Pulitzer Prize winning cartoonist Berkeley Breathed piqued politicians and professors alike in his student comic strip, "Academia Waltz." His fans at the University of Texas cheered when his characters graduated to the big time: national syndication by the Washington Post in the strip, Bloom County, featuring Opus, the sanguine penguin. (See the Sidebar: Tarradiddle.) Twenty years later, Breathed's latest entourage of characters is alive and well and rendered in 3D at Threshold Digital (TD) in Santa Monica.

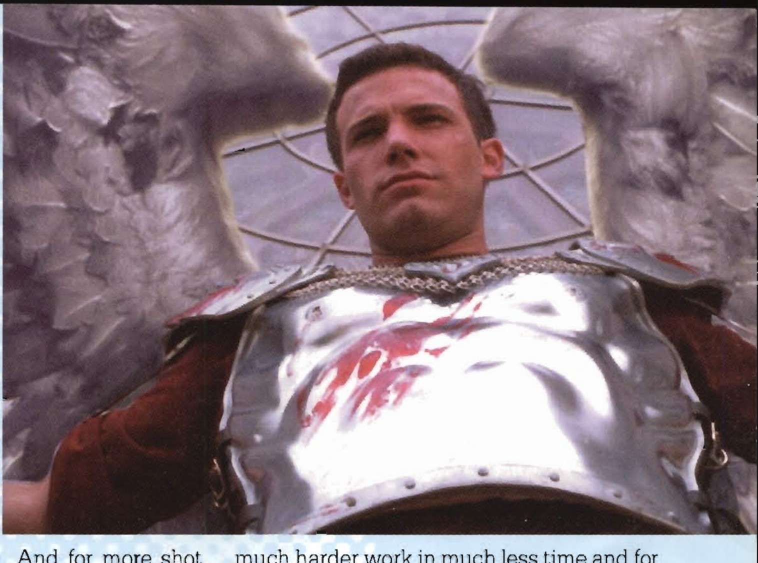
Based on Breathed's newly released children's book, *Edwurd Fudwupper Fibbed Big*, a five-man animation team at TD is recreating Edwurd, sister Fanny, and the three-eyed Alien Giant. (See Mike Hatfield's tutorial, *Fleshing Out Fanny*.) Directed by Breathed, the goal is to finish the eight-minute animation about Edwurd the whopper wielder in time for Oscar consideration.

The LightWave assignment is the latest in a whirlicane pace of projects for Threshold Digital Research Labs (their official name), which is part of a triad of companies that comprise Threshold Entertainment. (See the Sidebar: *Over the Threshold*.) Most of their workload involves creating visual effects for movies including *Gen-Y Cops*, a Hong Kong production, *Beowulf* for the European market, *Highlander: Endgame*, and *Dogma* .

Last summer's surprise success, *Scary Movie*, the sexy, scatological, slasher spoof directed by Keenan Ivory Wayans, may feature the first X-rated animation in a major Hollywood film. (Another LightWave milestone?) "Weird," says Digital Artist Matt Morgan about working on the movie, "we weren't sure how many of our effects were actually going to end up in the film, because they were so raunchy."

But the computer graphic raunch remained including several CG semen enhancements, a couple of binary "below the belt" shots, and an overly enthusiastic fellow digitally "bleeping" an ear. Brian Jennings, visual effects supervisor on three TD films, explains that for this movie, "we were doing more jokes, so we had a little more flexibility; we didn't have to be perfect." But, says Morgan, "we concentrated on making them more accurate and realistic." A cinéaste sitting next to Morgan during the film had a really hard time understanding that all of the pubes shots were CGI. "Which is good", he says. "I like VFX work that's seamless, and those shots are," adding, "LightWave always renders images that are very photorealistic, and was ready to handle any technical challenges we threw at it." Indeed.

In the sci-fi teen drama *The Faculty*, Jennings, again the visual effects supervisor, looked for accuracy, "a real monster, a real high school." In the film, a motley crew of nerds, outcasts, and homecoming royalty team up to save their school from incognito body snatching aliens. Working with an amazingly tight schedule, TD modelers and animators supplied the Robert Rodriguez film with an eerie series of challenging shots. In one sequence, a nude student prowls through a locker room. Her true alien identity is betrayed when her creepy,

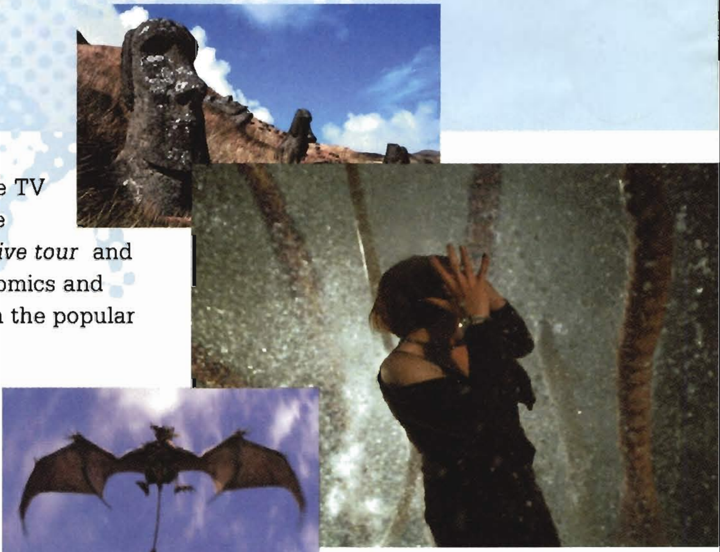


crawly creature shadows are cast on the walls. The actress "needed to be hand-rotoed, frame-by-frame, over about 280 frames - very tough when she's walking with benches in front of her. The lockers were built in 3D and tracked for the shadows. Shadows were also cast through 2D transforms in composite," says Morgan.

Another recent film project for TD was *Simon Sez*, which came and went faster than Dennis Rodman changes hair color. Directed by Kevin Elders, the action/espionage/murder mystery stars Rodman as Simon, an intrepid agent who (with his inventive cohorts) concocts a robotic spy-fly. "Mike Hatfield modeled, lit, and animated the fly. I textured, surfaced, tweaked the lighting," Morgan explains. "We used LightWave, Realitools2, Worley's Polk plug-ins, and Digital Fusion. Many of the metal surfaces were accomplished using Realitools2, Fresnel 2, and using very high surface specularity settings, along with ray-traced reflections, and reflection images mapped to the inside of a cube." (See the Fly in the Table of Contents and find a mini-tutorial on the fly eye at Morgan's site, www.fxartist.com. And for more shot info, visit www.jeremyyates.com.)

Jennings, who is currently on set with Sylvester Stallone for his CGI laden car racing, car crashing thriller, foresees a future where "dramatic films will rely more heavily on visual effects and animators will do much harder work in much less time and for much less money." A sobering prediction for the animators on Fudwupper who are having the time of their lives. "This is definitely the most fun project that any of us has ever worked on, our dream project," says Morgan.

Over the Threshold



USA Today described Threshold Entertainment as "part movie studio, part Web operator, part TV network, and part brand manager and marketer." Add in part digital visual effects studio and you have the ingredients for a prototypical, 21st Century entertainment company.

Inside their prosaic office building, past the executive office atrium, lies a dark cavernous CG workspace punctuated by monitors casting beacons of light that reveal a maze of cubicles adorned with relics of boyhood - action heroes, monsters, sci-fi and futuristic jejune juju. Upon closer scrutiny, many of the mini-momentos as well as the massive armaments on the wall are artifacts from *Mortal Kombat* , the four-billion dollar franchise managed and proliferated by Threshold Entertainment.

Larry Kasanoff (once James Cameron's co-conspirator on LightStorm Entertainment's hits, *Terminator 2* and *True Lies*) founded Threshold in 1994 to specialize in management of entertainment intellectual properties (the consummate Hollywood oxymoron). Enter *Mortal Kombat*, the movies, the TV series, the CD-ROM, the music album, and the *live tour* and add the toys, t-shirts, comics and cards - all spin-offs from the popular video game.

To maximize the franchise opportunities, the company created two subsidiaries, Threshold Digital Research Labs (TDRL) in 1997 and in '98, www.TheThres-hold.com. The latter is an online playroom and emporium for guys, from pre-teen to forty. With a mantra of "No Crying. No Hugging. No Learning.", the website features zaftig heroines like the tata twins in thong bikinis reciting classic literature (literally). Expect boobs, chases, races, more boobs, explosions, games, and more boobs.

TDRL, the LightWave studio, produces digital visual effects and animations for the entertainment industry. Alison Savitch, President of TDRL, aspires for the studio to become a premier LightWave house, "we have as much talent here as anywhere," she says, "but I always felt it was about the artist instead of the paintbrush you give them."

"I love it here," adds visual effects artist Jeremy Yates. "Artists with versatility are given the freedom to work on shots from concept to completion without spitting everything into a big assembly line. This freedom has enabled us to streamline our production pipeline and give artists the creative fulfillment they crave."

As for the hormones that drive the company, arm yourself for future franchises: GI Joe, Duke Nukem, Heavy Metal, and real life World Wrestling Federation pin-up personality Rena Mero.

Tarradiddle Pants on Fire

The following is an interview with Berkeley Breathed.

D&D: Let us introduce ourselves. We were both at the University of Texas in the '70's so we knew Opus before he was syndicated.

BB: Liars. Didn't invent Opus until after I graduated. Let's move on. By the way, Fudwupper is about a liar. Good start.

[Editors' confession: We followed *Academia Waltz* in the 70's and *Bloom County* in the 80's, both in student newspaper, the *Daily Texan*. Opus, the penguin, waddled to life in the 80's.]

D&D: We were excited to see your latest work, Edwurd Fudwupper Fibbed Big, at Threshold Digital.

BB: I dunno. You could be lying again. Maybe they showed you outtakes from *Toy Story* and you were confused. Low res CG is anything but spectacular - which is the problem, 'cause studio execs always want to see work in progress, and it is up to the director to shoot anyone who lets them peek at it.

D&D: Do you know how unusual it is for a writer/artist to direct his own CG film?

BB: You nailed it. I slept with everyone at Nickelodeon Films until I got the job. If that hadn't happened, I'd have to do the next best thing: in animation, there is a glut of everything except for stories that are appropriate for it, so I wrote a book expressly to turn into a short.

Fortunately, Nick recognized this as such. Animation is desperate for good raw material. Deliver it and one can get a tiny itsy-bitsy slice of control.

D&D: How did you feel about another artist translating your 2D work into 3D?

BB: I threatened to kill them. This is always a good place to start, because CG artists by their nature aren't all that healthy, and they're very sensitive about their mortality. Once I established this basic relationship, it was a matter of me adapting to them, mostly. We both discovered how nearly useless 2D drawings are at model building. So I sketched first, and they built, and then we changed.

D&D: Who do you see as your audience for the movie? Is it the same as for the book?

BB: Yes. Porn actresses. They're suckers for this, no pun. Also children, naturally. But if it isn't amusing to the rest of us, we failed. This isn't the *Rugrats* .

D&D: How does this medium - CG animation - affect your work? Do you tell your story the same?

BB: Yep. Which is a hindrance in books, I think. Right now in children's picture books, the thing to do is write storyless stories that merely convey a mood, anecdote or moment. True stories, with set-ups, conflict, rising action, climax and resolution - are nearly gone from children's picture books. Too complex. Somebody needs to thaw out Dr. Seuss. No, I'm sorry, it's Disney they made into a popsicle.

D&D: Why did you choose CG over cel animation?

BB: Pure cell animation is wilting. It simply cannot match the visceral, temporal impact of 3d environments. Still — we have much to learn from 2d about character, movement and style. This we've mostly failed at so far, except for the obvious successes.

D&D: For you, how do your 3D Fanny and Edwurd differ from your 2D characters?

BB: Completely. Fannie is completely different. 3D Edwurd had to look more like a real kid with real features. He looked like a leering evil ET when we translated my drawings literally. We tested on some kids playing outside the studio and the police arrived later. THIS says everything about our limitations in 3d. These wouldn't be concerns in 2D. It's very limiting. But then you get life like you could never get in 2D. It's a trade.

D&D: We heard that you did the storyboards for the film. Do you think of your 2D characters as mobile in your strips and books?

BB: Yes. This is why I quit cartooning. My ideas had to start moving somewhere else than in my head or I would go nuts. If Jeffrey Dahmer had acted on this sooner, he might have completely skipped the cannibal thing and gone right on to animation, where he belonged.

D&D: Your print work always seemed motivated by more than entertainment. What were your motivations when making this film?

BB: Telling a good story with a heart without being too heartwarming. The strips always had another agenda — to make a point. Pure storytelling is something else. Telling a meaningful story in Hollywood — for children — without being sentimental, is my private creative mission. Syrupy sentiment completely kills children's films.

Fudwupper is actually on the edge with this - but you will see no glistening tears rolling down cheeks - or sniffles of disappointment. But then you won't see chainsaws or cleavage either, much to my mother's disappointment.

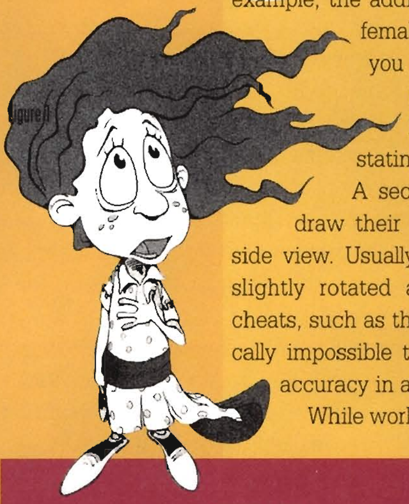
D&D: What future animations do you have planned?

BB: Hollywood has trouble with dog movies. I'd like to make a good one. And nobody's quite got cartoon animals in 3d yet that aren't irritating... so it'd be a fun challenge. I'm also thinking about remaking "American Beauty" as an animated children's film. If you add a couple of smart aleck talking pig sidekicks to Kevin Spacey's character, you might have something.

Fleshing Out Fanny

From 2D Cartoon to 3D Model

By Mike Hatfield



Converting a 2D artist's cartoon character to a 3D model requires resolving a special set of challenges very different from those posed when modeling a realistic character. Most often the 2D character's identity and attitude is defined with a brevity of lines. This emphasis magnifies the importance of each stroke. For example, the addition of one line under the eyes of a female character ages her 15 years. In 3D, you must translate the significance of every line/wrinkle represented in 2D, but without exaggerating or understating the cartoonist's intention.

A second consideration, 2D artists rarely draw their characters in a straight-on front or side view. Usually, they'll present the character at a slightly rotated angle. Also, cartoonists often use cheats, such as the sideways mouth, which are physically impossible to recreate in 3D while maintaining accuracy in a variety of poses.

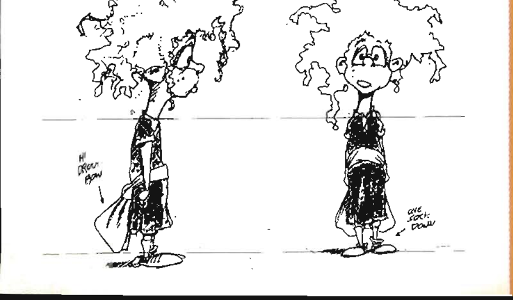
While working as the Modeling Supervisor with Berkeley Breathed on his animated short *Edwurd Fudwupper Fibbed Big*, I learned a great deal about these differences.

Reference Art

Since some cartoonists have a hard time communicating how their character look in 3D, you should start with reference art provided by the 2D artist. Instead of a front or side view, request a picture of the character in a full pose with an exemplary facial expression. Then, have the artist create front and side view interpolations based on that original piece. (Figure 1)

When modeling, these indispensable 2D templates provide a constant visual reference of proportion, detail, and especially asymmetry. (Figure 2) A hand drawn cartoon character never has symmetry. Although you initially will build the character symmetrically, you should introduce lopsided imperfections, particularly on the face. Endomorphs make this very easy. You apply the idiosyncrasies to the base object and Modeler will automatically filter them to the morph targets.

Figure 1

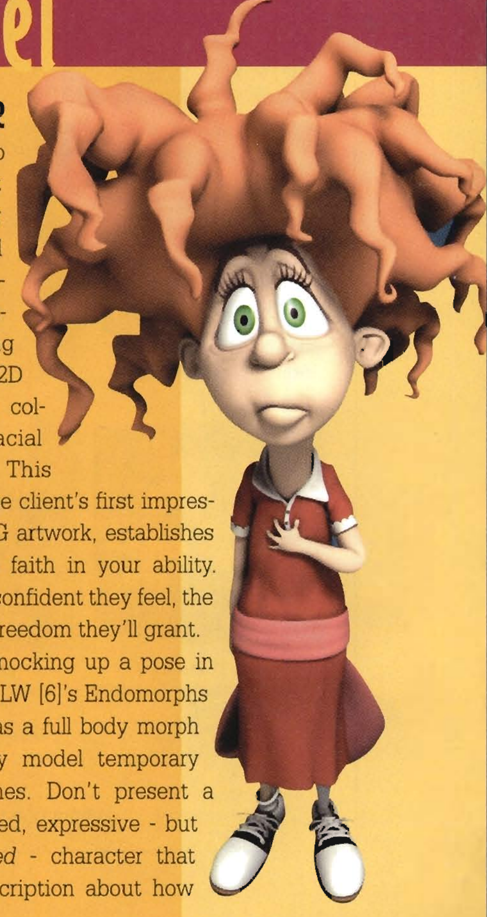


The outstretched arms, spread legs stance from Leonardo da Vinci's Vitruvian Man sketch is called the "da Vinci Pose." You should not request drawings of the character in this pose from the 2D artist. The pose is unnatural to them and the proportions are misleading. I prefer to model from a drawing of the character in the "relaxed standing," arms-down pose.

In addition, never present your 3D model to the 2D artist in the da Vinci pose. Most 2D cartoonists have serious reservations about CG artists being able to maintain the artistic integrity of their work. This frequent misconception stems from the belief that 3D artists are technically rather than artistically oriented. Showing them their beloved character in the unnatural da Vinci stance will only reinforce their concerns and panic them about what additional CG butchery their creations will endure.

The only person who really needs to see the da Vinci is the artist setting up the animation.

Display Pose

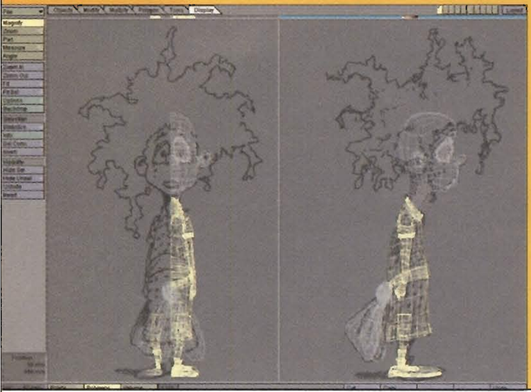


I prefer to show the client the character in a special "Display Pose" - a modeled setup matching their original 2D drawing, from coloring to facial expression. This model, often the client's first impression of your CG artwork, establishes the 2D artist's faith in your ability. And the more confident they feel, the more creative freedom they'll grant.

I begin by mocking up a pose in Modeler using LW [6]'s Endomorphs and saving it as a full body morph target. Quickly model temporary hair and clothes. Don't present a beautifully posed, expressive - but *bald* and *naked* - character that requires a description about how great it will look with hair and clothes. Clients tire quickly of explanations. Always try to identify and eliminate justifications.

For special facial expressions, first make a separate morph target, then incorporate it into the Display Pose. This way, if you need to rotate or tilt the head, you still can retain a back up of the unmodified facial morph target. If the Display Pose is representative, you will use that display morph facial expression often and you should store it in your facial expression library. Also, if the client revises the model, you can return to the non-rotated facial morph, apply the tweaks, and then re-rotate into position for the pose. This technique allows you to keep the head centered on its axes, making working in symmetry mode possible.

Figure 2



Revisions

After the initial viewing, even with a spectacularly accurate 3D rendition of a character, the client *will* want changes. Count on it. Set aside a day when the client can sit next to your workstation and make changes in real-time - an exciting interactive experience for both modeler and 2D artist. He or she becomes involved in the CG modeling, which soothes the feeling of "giving up" their art to us.

To create a highly interactive environment, you need to optimize your computer's interface speed. Cut and paste parts into separate layers, and reduce patch division to 2 or 3. Use point handles, a great visual description of Nurbs. Describe them to your client as little needles sticking into the object that can be pulled or pushed to deform it. Try to work almost exclusively in the OpenGL perspective view, which enhances the non-technical artistic feel of the experience. Make sure your computer can handle real time revisions before you sit down with the client.

And don't complain too much about your computer or the software. You won't hear a 2D artist bitching about all the bugs in his paints or ink. Our tools need to look just as refined and accessible. Remember that LightWave Modeler is an amazing tool; and to someone who has never seen 3D creation in person, it is a miraculous experience.

An alternate method of revision is to print out client specified views so they can draw on them. Rotate the model around in the perspective view until you get the angle on which they want to sketch. With their drawing as a guide, you can return to that angle and tweak the model to match.

The goal is to create great characters - the result of an effective collaboration between you and the client. If you succeed, the client will embrace you as a fellow artist and acknowledge CG 3D as an exciting medium to present their story.

Mike Hatfield is the Modeling Supervisor at Threshold Digital. Contact him at mikeh@threshold-digital.com.

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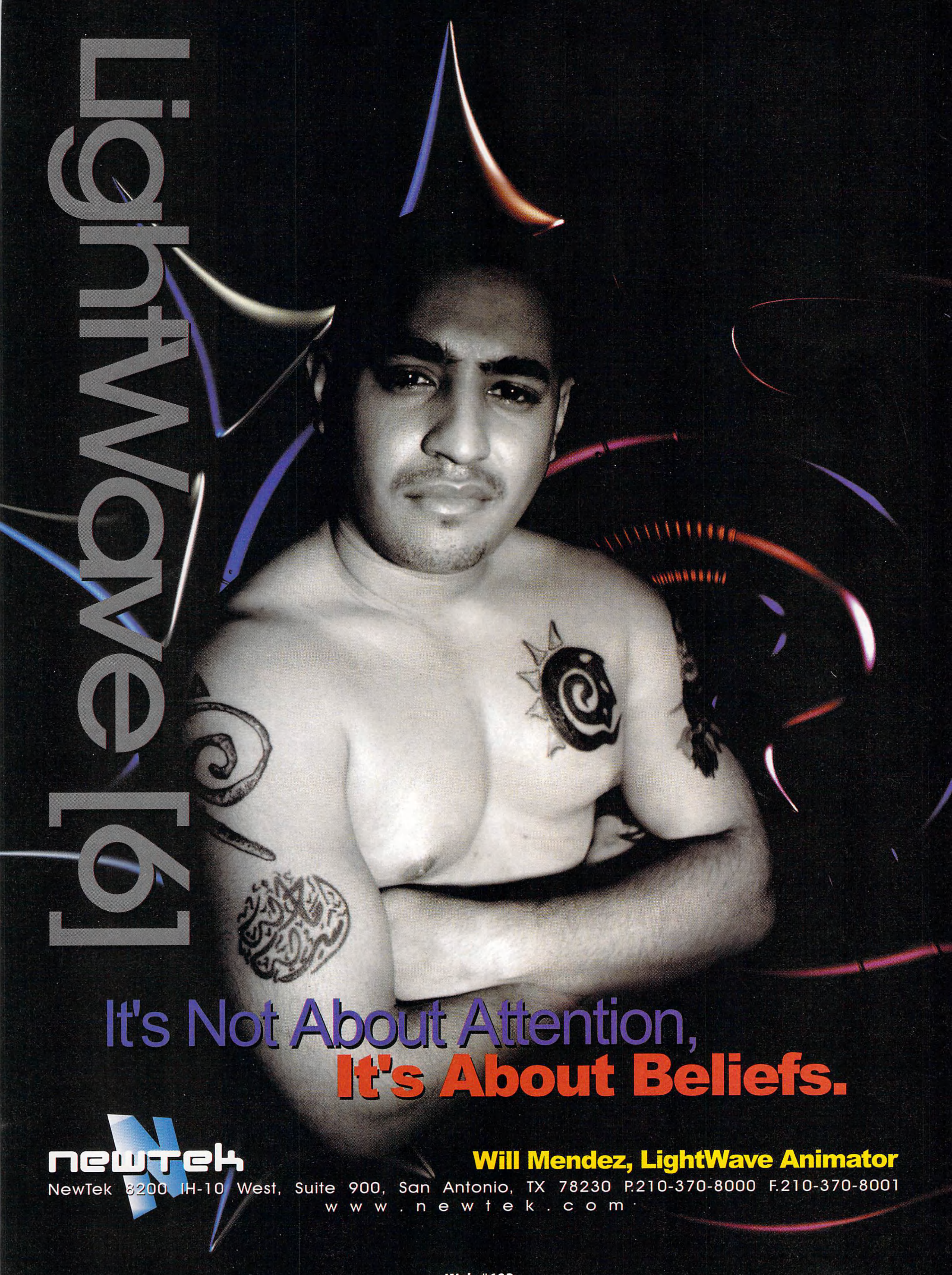
LightWave [6]
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Will Mendez, LightWave Animator
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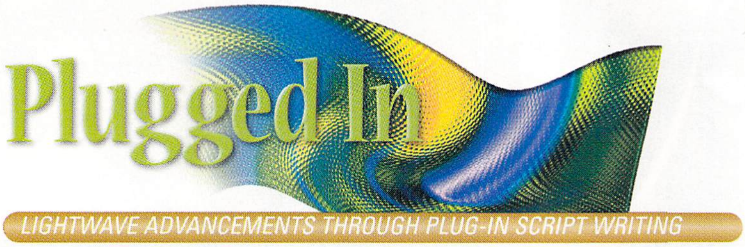
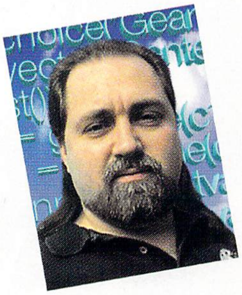

Plugged In
LIGHTWAVE ADVANCEMENTS THROUGH PLUG-IN SCRIPT WRITING



V MARKS THE SPOT

The LScript Diet

Scaling Your Weight Maps

by Bob Hood

LightWave [6] is like an old friend you haven't seen for a while–familiar but full of new tales to tell. The application contains so many new features to discover and changes to explore. We have not spent much time in this column lately with our old compatriot, Modeler, so let's explore one of the more interesting developments in the Modeler [6]: Vertex Maps or VMaps.

One of the new power features in LightWave, VMaps allow individual vertices in a mesh to optionally be associated with one or more floating-point values. Each Vertex Map is either a type defined by the user or one of the pre-defined types used by LightWave for special purposes.

Among the types pre-defined by LightWave, Weight VMaps are used by Layout to apply effects to the mesh based both upon the strength of the values and their locality. For instance, bones can now use Weight VMaps to limit the area of their influence.

LScript v2.1 now has the capability to access VMap information using its new VMap() Object Agent constructor, which is available to all LScripts, regardless of the host application (Layout or Modeler). However, the capability to create or edit VMaps is reserved only to Modeler LScript.

Get Out the Map

Listing 1 is a Modeler LScript called ScaleWeight, which is designed to scale the values of a user-selected Weight VMap by a user-defined amount. In addition, it also illustrates some new features introduced in LScript v2.1.

On line 6, we waste no time in accessing the available Weight VMaps in the system. If no VMaps of that type exist, the VMap constructor will return "nil." We use that fact to "short circuit" a Boolean test (short-circuited Boolean operators are new in LScript v2), and display an error message if no VMaps of that type are defined. Since the error() function will halt the execution of the script (or disable further execution in Layout) after displaying its message, we can safely ignore any logic paths following it.

If we get a valid Object Agent from the constructor, we iterate through all of the VMaps of that type and gather up all of their names (line 8). On line 10, when we store the VMap name: we are using the plus-assignment operator ("+=") with an uninitialized variable named "vmapnames." A new v2.1 feature, an overloaded plus-assignment operator will automatically generate a linear array to hold values if the container holds the value "nil." We capitalize on the fact that LScript variables are automatically initialized to "nil" to generate a linear array of VMap names. Once the first assignment generates the array, subsequent assignments add the new value to the end of the array.

Using the array of Weight VMap names, we post a requester to allow the user to alter some operating parameters. They can not only select a map to edit, but also an amount (converted to a percentage) by which the values in the map will be adjusted.

Please note that LScript v2.1 inverted the meaning of reqbegin()'s optional second parameter. Previously, this Boolean value explicitly selected the Panels interface plug-in when a "true" value was specified. However, in v2.1, the Panels interface has become the default for LScript. So, providing a "true" value now selects Modelers internal interface code instead.

Also, because Panels is now a shared library to which LightWave is directly linked, it will be available to plug-ins. For this reason, the reqbegin() function no longer returns any values to indicate whether or not the plug-in has been loaded by the user. No such conditions will ever exist now in LightWave [6].

Map Mining

Armed with the name of a VMap, and a percentage, by which its values are to

listing 1 - ScaleWeight, a Modeler LScript

```
001:   @version 2.1
002:   @warnings
003:
004:   main
005:   {
006:   vmap = VMap(VMWEIGHT) ||
       error(“No weight maps in
       mesh!”);
007:
008:   while(vmap && vmap.type ==
       VMWEIGHT)
009:   {
010:   vmapnames += vmap.name;
011:   vmap = vmap.next();
012:   }
013:
014:   reqbegin(“Scale Weight
       VMap”);
015:
016:   c1 =
       ctlpopup(“VMap”,1,vmap-
       names);
017:   c2 = ctlminislider(“Amount”,
       50,1,100);
018:
019:   return if !reqpost();
020:
021:   vndx = getvalue(c1);
022:   amount = getvalue(c2) / 100.0;
023:
024:   reqend();
025:
026:   vmap = VMap(vmapnames
       [vndx]) || error(“Could not
       instance VMap ‘”,vmap-
       names[vndx],”’!”);
027:
028:   selmode(USER);
029:
030:   moninit(editbegin());
031:
032:   foreach(p,points)
033:   {
034:   if(vmap.isMapped(p))
035:   {
036:   values = vmap.getValue(p);
037:
038:   for(x = 1;x <= vmap.dimen-
       sions;x++)
039:   values[x] *= amount;
040:
041:   vmap.setValue(p,values);
042:   }
043:
044:   monstep();
045:   }
046:
047:   monend();
048:   editend();
049:   }
```

be adjusted, we acquire an Object Agent instance of the selected VMap on line 26. Like the first time we grabbed a VMap instance, we "short circuit" the return value of VMap() to an error message if we cannot get a valid instance.

The selmode() function is called on line 28 to filter any point selections only to those the user has selected directly. Due to the way that Modeler "thinks," if no points are explicitly selected, then all points are selected implicitly. This allows the user to adjust only those values associated with the selected points.

Because VMaps can only be edited during Mesh Data Edit transactions, the editbegin() function is called. Its return value, the number of "visible" points, is piped to the moninit() function so the visible progress monitor can show the status of lengthy processing.

We need to iterate through all the visible points to arbitrarily adjust our Weight values. Each point needs to be checked to see if it has associated values in the selected VMap. The new foreach() iteration control is used to control the looping (line 32). This iteration control simplifies the process of looping by taking just a container to hold individual values through each loop, and a container that holds some data type capable of being traversed in a linear fashion. In this case, the automatic "points[]" array is used, so the provided container "p" will hold a unique point identifier each time through the loop.

Each point identity is checked against those that exist in the selected VMap by using the isMapped() method. If a point exists in the map, then it has one or more associated Weight values. Figure 1 shows a Weight map assigned to particular vertices. The intensity of the color areas corresponds directly to the value of the Weight values there.

If the isMapped() method returns a "true," then we use the getValues() method to retrieve all the Weight values associated with the point. These values are stored into an array, which is then placed into the "values" variable. We then use a for() loop to process all the values returned. The number of

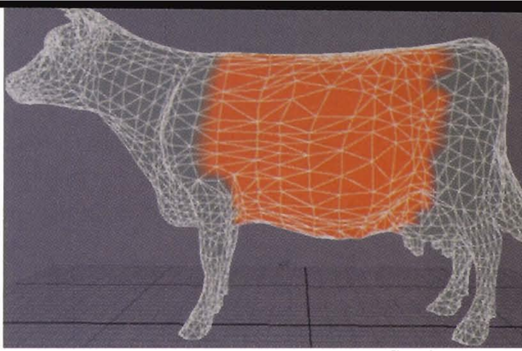


Figure 1

Weight values associated with each point is found in the VMap Object Agent's "dimensions" data member. All points in the map will have this number of associated Weight values, whether or not those values have been set to specific values. Each point value is then scaled by the user-defined percentage (line 39).

When all values have been scaled, the setValue() VMap Object Agent method is used to update the values for the indicated point identifier. Figure 2 illustrates the results of scaling the Weight values in the selected map by 25%. The intensity of the color is now a quarter as strong as it was originally.

Because this method actually modifies the VMap values, it is only exported by VMap Object Agents generated by Modeler LScript. Conversely, it is the only VMap Object Agent method that is *not* available to LScripts within LightWave Layout.

As with any mesh editing operation, the changes made to the VMap can be aborted by calling editend() with a Boolean "false" value. The default action is to accept any changes, which we do on line 48.

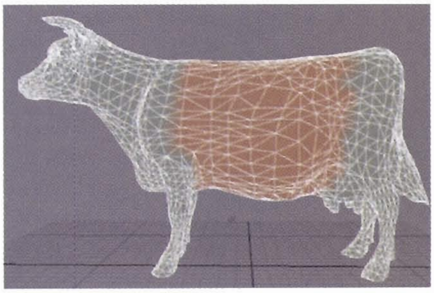


Figure 2

VMaps are a powerful new feature in LightWave. The ability to alter them programmatically can help streamline your management of these new object attributes. It also can go a long way in helping you win friends and influence people.

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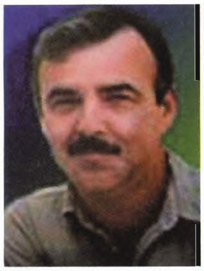


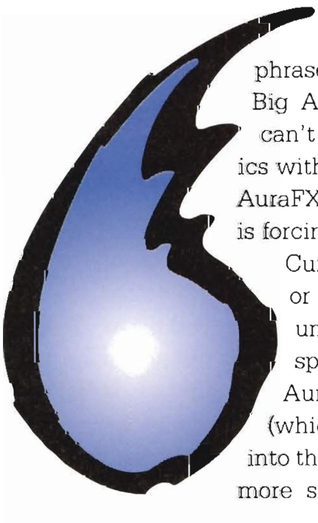
WANT FX POWER?

Buckle up, Sonny ... We've Got "The Right Stuff!"

by Steve Bowie

Hi, and welcome back to Aura Essentials! This edition of AE is a bit of a grab bag; something for everyone interested in Aura. We'll start with a look at Visual Inspirations' popular add-ons, the AuraFX series. Next, a mini-tutorial based on a real world situation (and some sidelights on the project it springs from); and finally, a few words about the future.

Effects and More Effects with AuraFX



I've wanted to review the AuraFX volumes from Visual Inspirations (VI) for some time. However, this is not really a review ... it's more of a "rave!" I love this stuff! Let me paraphrase NewTek's never-subtle apostle from the Big Apple (you all know who I mean): "If you can't create stunning broadcast quality graphics with this stuff, you're in the wrong business!" AuraFX just makes it so darn easy. The hard part is forcing yourself to quit playing with it!

Currently, four volumes are available - singly or as a set. Installation is a breeze. Each volume is divided into subsets of ten, corresponding to the maximum number of scripts Aura's George panel can list. So, Volume 1 (which offers 30 different effects) is sub-divided into three sets. Subsequent volumes each offer 20 more selections. Also included with each are some custom plug-ins that add a few conveniences lacking in Aura itself – like a "render progress gauge."

Lock and Load

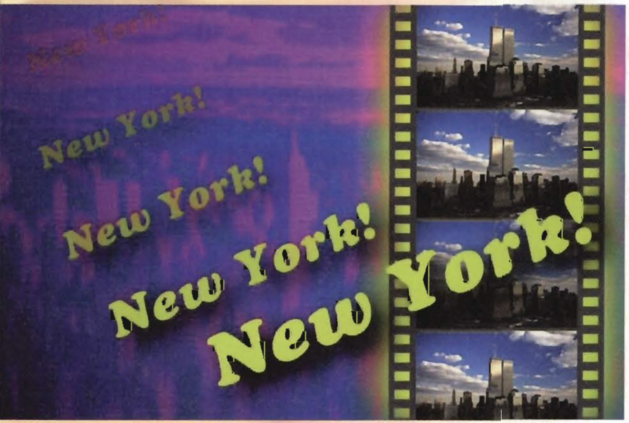
Rather than requiring you to select scripts one at a time, VI has included George configuration files (.agc's) which load one "panel-full" of effects at a time. Load "Visual1.agc" into the panel to access the first batch, and so on. A .doc file in the VI directory describes each effect. In addition to basic usage, it often offers suggestions and inspirations for possible applications. Frequently, different effects can be used in concert with great results.

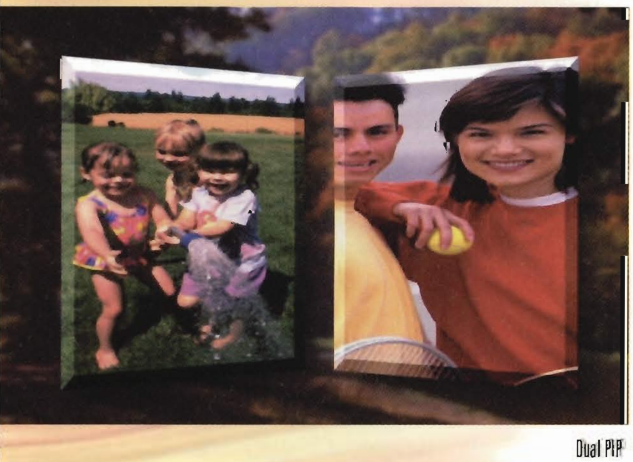
It's worth mentioning that, by default, each script presents a requester that politely inquires whether you'd like to read the docs for the effect. Select "Yes," and you will be shown a brief blurb detailing what the effect does, how you should set up Aura's layers, and options you will encounter. You can switch this feature off; but I doubt many will do so, as the instant online reminders are really nice to have.

The effects fall into three general categories. The naming convention is a handy giveaway: script names may include the word "Wipe," or "Fade." For the most part, the rest end simply in "FX." Each volume contains examples from each category.

I'm not going to provide an extensive listing of each volume here. You can find that on Visual Inspirations website (http://www.vionline.com). We'll just consider a sampling. However, I'll tell you that a huge assortment of the cool things you see broadcast every night is represented. Animations an artist might have labored many hours over in another popular effects package which shall go unnamed (but its initials are the same as this column's) are "only a few clicks away!"

All the effects provide clean, professional looking results. Most feature attractive and simple options, along with practical defaults. Take the "Dual PIP" script, which combines three layers. One can bevel or outline the picture-in-picture elements, define the size of the bevel or margin, add a drop shadow and adjust it's options, and choose from a number of attractive preset positions. The example shown took me less than 15 seconds to create! (See DualPIP image.)


New York!
New York!
New York!
New York!
New York!
Filmstrip


Dual PIP

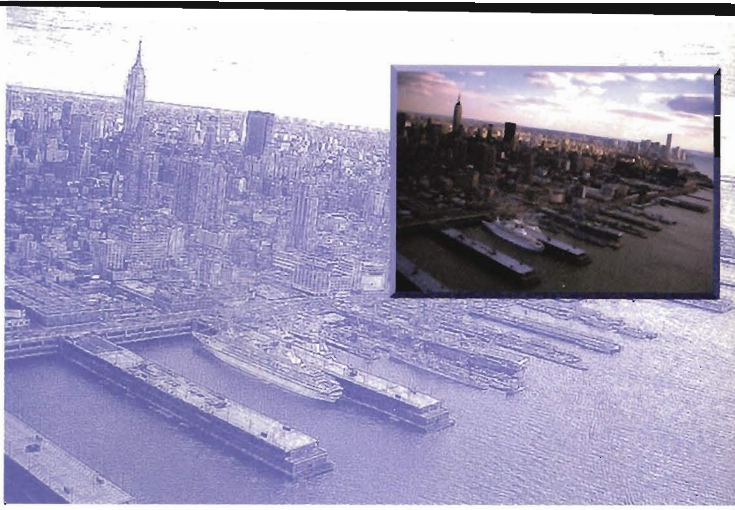
Some of the effects are fairly unique, for example, the "Breath FX" script. Applied to a graphic or title on a transparent background, it warps the image to appear as though it is breathing in and out. With a quicker cycle, think heartbeat. As with "most things Aura," this looks better animated, so I will stick a sample in the Aura Essentials section of the NewTekniques website.

I used the "Film Strip FX" to create the "New York" CG image accompanying this article. (See Filmstrip) Setting something like this up without Aura FX could be very time consuming. The script makes it seem like child's play, and it looks even better animated! Even effects that at first might sound redundant (like "Page Curl Wipe" and "Drop Shadow FX") turn out to be pleasing and useful alternatives to Aura's native tools.

CG—Cool Graphics

Titles and credits that blur, fade, smear and smudge in nearly indescribable ways seem to be "de rigeur" these days. AuraFX provides these effects in abundance. Here are just a few of the offerings that pertain directly to CG applications – most are self explanatory; some apply just as well to wiping video sequences; all look great:

Rainbow Text FX
Swirl Fade
Ripple Fade
Zoom & Stretch Wipe
Emboss Text FX
Texture Text FX
Split CG Scroll
CG Scroll
Rack Focus FX
Disintegration FX
Sizzle Text FX
Glint FX
Smear Text FX


ImageOn

Consider a few more quick examples (its SO hard to choose!):

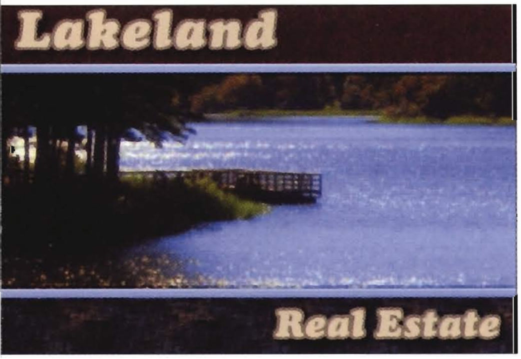
The first is "Image On Image FX", which adds a scaled version of the main image to a user defined box, with an optional border and/or bevel. The main image may optionally be processed too, using a variety of novel presets. (See ImageOn)

"Fancy Letter Box FX" quickly adds scrolling seamless textures to the top and bottom of the screen (with many useful options) as seen in the accompanying illustration. (Letterbox) The beveled separator bars are optional. The "Checkerboard FX" produces multiple smaller incarnations surrounding the scaled-down central image. Alternating clones can be selectively colored, and the whole lot can be beveled according to taste. (Checker)

I encountered very few problems with Aura FX, and all were easily overcome. I e-mailed the developer about one small bug, and he had the problem solved before the day was out! Ideas for new effects never cease, and we cannot wait for more good things to come from Jeff White and Visual Inspirations!

I'll add a few more comments (and some animated examples) to the website; but as you imagine, I think you should just buy this set. If you can't

Checker



Letterbox

afford it, sell that old 8mm camera you never use any more, and use the money to purchase AuraFX. You will be effectively reimbursed the very next time you use Aura for a job!

Feeling Blue ... Oh, What to Do?

About a month ago, a little flurry of queries to the Aura mailing list on eGroups.com piqued my curiosity. Ralph McCloud was looking for a solution to a compositing problem, and hoping Aura would be the answer.

Ralph is heavily involved in an independent production called "The Pickford Project." According to www.pickfordparadox.com, "PICKFORD PARADOX is a full length, independent movie being edited in Myrtle Beach, SC. A comedy in the vein of the old 'Cheech and Chong' movies, PICKFORD PARADOX incorporates digital compositing of silent film stars such as Charlie Chaplin with a hilarious premise and script to create what one critic has already called 'one of the funniest ideas I have ever seen!'"

The reason for Ralph's Internet S.O.S. was to find a way to "remove" an actor from a short clip from an old silent movie. It was necessary to excise the original actor to make room for a "replacement" – current footage of an actor, keyed to appear as though he were interacting with Charlie Chaplin!

While on the surface seemingly quite involved, the elements of the job are really pretty straightforward using Aura's powerful tools. Ralph had not used Aura's key filters before, so I provided some rudimentary instructions. These were all he needed to get a handle on the task. We started with chroma keying, since he inquired about that first.

I wrote: "Load your video streams into two layers, blue screen on top. To begin experimenting with settings, pick a typical frame (with the upper layer selected). Next, invoke Filters/Color/Key/Color. Click on the color swatch in the requester (to enable the color-picker function), then pick a typical blue pixel in the scene. Tweak the "Range" and "Fade" mini-sliders to suit your taste. (Filters/Color/Key/Chroma offers more control)" (Chaplin1)

(Ralph later advised, "One initial problem was that our actor was so visually sharp, while Charlie and the room were a lot softer. Before applying the chromakey filter, I applied smoothing to the entire blue screen clip to soften it up.")

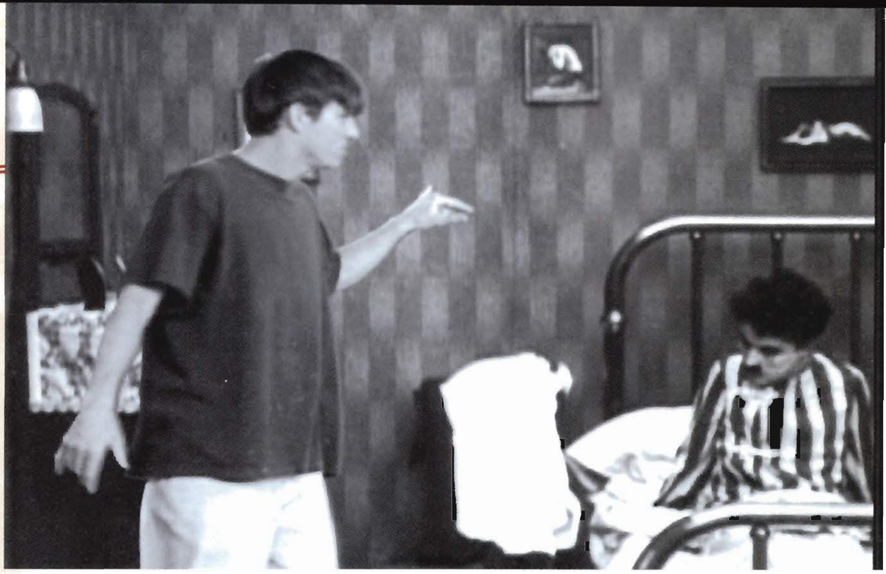
Move Over, Charlie!

That worked well enough, but Ralph was soon back for more. How could he lift an actor out of the room, leaving only Charlie behind?

"I wanted my actor to walk into a bedroom where Charlie Chaplin is in bed. A couple of problems with this initially: in the actual scene another actor is already in the room with Charlie. So I have to get that actor out of the room and put my modern day actor in. The entire scene lasts about 10 seconds, but there is only about 1/2 second when the other actor isn't occupying the left side of the room. Another problem was that I couldn't simply "freeze the shot" when he wasn't in the room, because the left side of the composite would look frozen, while the right side with Charlie in bed has a lot of random brightness and scratches associated with old silent movies at that time." (Chaplin2)

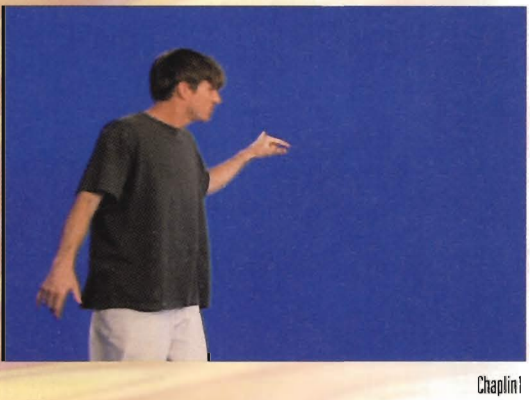
As it turned out, we got a few breaks that helped in solving the problem. First, the camera and lighting in the scene were static. Vitally important was that half-second in the sequence in which the left side of the room was empty! That offered a solution. We just needed to create a clip of suitable length (the duration of the blue screen insertion), and merge the left side of those frames only with the right side of the main scene.

I suggested Ralph load the main clip into a new layer, calling it "main." After



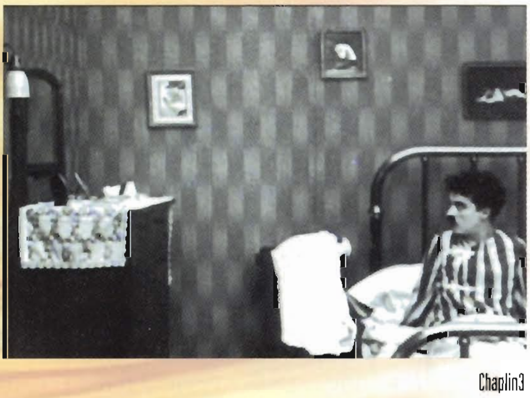
Chaplin4

deciding the number of frames in "main" which needed the left side of the frame to be replaced, Ralph placed a corresponding scene in "left," using frames in which that side of the room was unoccupied. (Chaplin3) He had previously copied the existing half-second of useable frames to 10 seconds in Speed Razor, though Aura could do this easily too. Grabbing the "left" layer's midpoint (on the timeline), he slid it laterally to line up with the area of 'main' needing correction.



Chaplin1

Chaplin2



Chaplin3

Next, I suggested Ralph make a new, empty layer above the trimmed "left" layer. The new layer was named "matte," and Ralph stretched it to the same length as "left" (no need to make "matte" an anim layer). After selecting Aura's "Filled Rectangle" tool, I asked Ralph to choose "Color" painting mode.

A filled rectangle (any color) big enough to completely cover the right half of the scene was needed. It had to completely hide the part of the frame where any action by the actor on the left in "main" might occur. Then, Ralph applied Filters/Basic/Smooth with the smooth factor set to 40. By this point, "matte" consisted of a single frame scene of an appropriate length with its left side completely transparent, the right side completely opaque, and a nicely blurred transition zone.

Changing the paint mode to "Erase," Ralph next dragged the "matte" layer icon onto the "left" layer icon. This removed all traces of the right side of the room, leaving the unoccupied left side ready for further compositing. Changing the paint mode to Color and dragging the "left" layer icon onto the "main" layer icon completed this part of the job.

All that remained was to key in the blue-screened actor. The frames needed to be converted to b&w of course. Before doing so, I suggested that Ralph experiment with adding a bit of noise (scratches, streaks, grain) to the new video footage so it would better match the original.

The steps above are all really quite simple, but the end result was quite satisfactory – you can judge for yourself. (Chaplin4) Maybe you can make use of some similar techniques to add interest to your own work – watch out for copyright issues, though!

That's Not All, Folks!

I'll conclude this edition of Aura Essentials with a few words about the upcoming release of Aura version 2. It is entirely possible that Aura2 will be shipping by the time you read this. Currently, the rumor mill is indicating a shipping date in November. Believe me, though, that even if it turns out to be later, the wait will have been worthwhile! While version 1 has been a blast, Aura2 adds a lot of things you have been asking for, and it will place some gorgeous tools in your hands! When it does *NewTekniques* and Aura Essentials will be right here to offer friendly insight on its use! Between now and then, keep your eye on my Aura pages on the *NewTekniques* website for updates (and downloads!

Steve Bowie, a longtime digital dabbler and enthusiastic LightWave and Aura user, also writes the Aura Essentials column at www.newtekniques.com. He owns LIGHTWORX Graphics & Video, a NewTek authorized Toaster/LightWave dealership in Toronto. E-mail to steve@videotoasterworx.com, and checkout his website at www.videotoasterworx.com

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RECIPE FOR LETTUCE

A Dash of LightWave, a Pinch of Photoshop

by
Kim Oravecz

Meet Switch A. Roo. He's the little guy that lives in your refrigerator and turns your light on and off for you. I spent a lot of time creating him. And it never fails that when I show the image to someone, usually the first thing they say is "Wow! How did you make that head of lettuce?" Poor Switch – so much for being the star of the image! So since you've asked, this tutorial describes how I built and textured the lettuce.

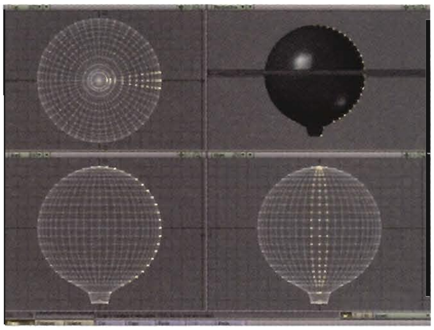

Figure 1

The software I originally used was LightWave 5.6 and Photoshop 5.0 for creating the texture maps. However, I am using LightWave [6] to create this tutorial. Oh, and I had a real live head of lettuce in front of me for reference.

First, we will start with modeling the head of lettuce.

1. Open Modeler and create a ball object: Globe, Sides = 48, Segments = 24 Center: (X,Y,Z) = (0,0,0); Radius: (X,Y,Z) = (250 mm, 250 mm, 250 mm).

Select the bottom row of points of the ball and pull down using the move tool [t]. Deselect the bottom row of points and select the next row up, pull these points down so they are approximately halfway between the last row and the row above. Then select the Stretch tool [h] and in the top view, put your cursor in the center of the circle of points. Hold down the left mouse button (LMB) and move your mouse to the left and also down to stretch the points so they are larger than the bottom row. Deselect the points.

Temperature Control
Shhhh!
You'll wake the
Catsup
Bacon Soda

2. A head of lettuce has all kinds of "ridges" around it. So we will create those next. In the top view, select a wedge of 3 rows of points along the right side of the sphere. (Figure 1)

Select your Dragnet tool and set the radius of the tool to approximately 200 mm (either by opening the numeric panel for that tool or by holding down the RMB and dragging a circular selection out to the size). Set this up in the top view. (Figure 2) Now, still in the top view and holding down your LMB, pull the points toward the right a bit. Now put your cursor in the front view approximately 1/4 of the way down the sphere and over the selected points. Drag your mouse up and to the right. Then move your cursor down to the bottom quarter of the sphere along the edge of the selected points and pull the points down and to the right a bit.

And last, click [h], move your cursor to the side view in the center of the sphere, and drag to the right and up to stretch the selected points larger.

3. For the final step in creating this wedge, deselect the outside two

columns of points so only the center of the wedge is selected. Reselect the Dragnet tool and reset it for a radius of 200 mm. Then with your cursor in the top view over the selected points, pull the points to the right. (Figure 3)

Continue doing this by selecting areas of 3, 4 or 5 columns of points and using your Dragnet tool and Stretch tool to push and pull the points into an irregular shaped head of lettuce. (Figure 4)

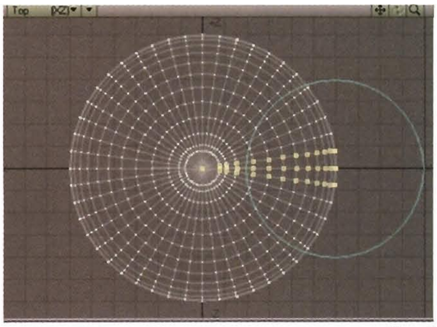

Figure 2

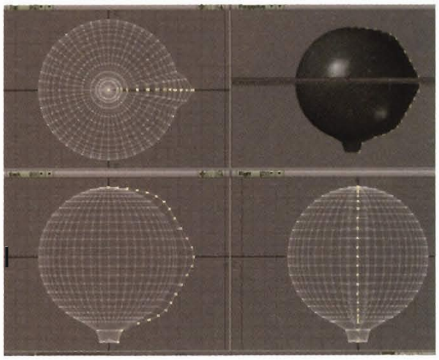

Figure 3

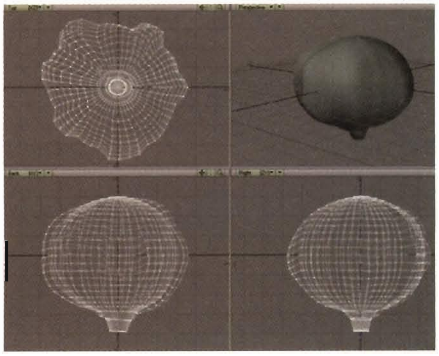

Figure 4

4. Make sure no points or polygons are selected. Go to your Polygon tab and select Triple [T].

Before creating the surface names, select the bottom row of polygons (make sure you are in Polygon mode first) and Bevel them or Smooth Shift them in. This will be the bottom of the core.

Now select the point in the middle of the last row of points and pull up just a few millimeters.

To name the surfaces, make sure no polygons are selected (no polygons selected means that all polygons are selected), press [q] and type in "lettuce-head-body" for the surface name. Next, select the top few rows of polygons and name them "lettuce-head-top." Select the very bottom 2 rows of polygons and name those "lettuce-core-bottom."

5. Next we will calculate the width of your image map. Go to the [Display] tab and select the [Measure] tool. Measure the distance across your head of lettuce by clicking on one end of the lettuce and dragging across to the other side. The measurement is displayed at the bottom left corner of the screen. Multiply that value, the diameter, by pi (3.14) to find the circumference of your object, which is the width of the image map you will create in Photoshop.

To determine the height of the map, highlight the "lettuce-head-body" polygons. (Select [Polygons] at the bottom and hit [w]. Go to the second to last row, "surf," and click on it. Select "lettuce-head-body" from the menu and click on the [+].) Measure that area from top to bottom and make a note of the number.

6. Now we want to add some "roughness" to the object by using the jitter tool. First, select all of the points in the object. Deselect the points that are in the bottom core of the lettuce and also deselect the top few rows of the lettuce. (Figure 5) Select the [Tools] tab and then select the [Jitter] tool. Enter a value of 10 mm into the X, Y and Z fields (.01). Save this object as "lettuce" and exit Modeler.

Lettuce Patch

Creating the Surface Maps in Photoshop

7. Grab a lettuce leaf from a head of iceberg lettuce, open Photoshop and scan it in. I scanned mine at 300 dpi to get the most detail. (If you don't have a scanner, you can download my scan from the Bonus Section at www.newtekniques.com.)

Make sure your "Layers" panel is open, ([Windows] menu -> [Show Layers]). Double click on that layer (it will be called "background") and a dialog box will come up where you can name your layer. I chose not to name mine but you can. Click [OK]. Now this layer can have transparency.

To change the height of the image to match the height of the surface in Layout, select the [Image] menu -> [Image size], make sure "Constrain Proportions" and "Resample Image" are checked and "Height" is set to pixels. Enter the height you measured in Step 5. [OK]

8. Select the white background of the scan and delete it. You now should have your lettuce leaf on a transparent background. (Figure 6) The size of my file was 515 wide by 364 tall. Next, I changed the canvas width to 1500 pixels (the circumference from Step 5, rounded down for simplicity). [Image] Menu -> [Canvas Size], change the width to 1500 and click on the middle left square for the anchor point.

9. Make a duplicate of this layer and move it over to the right. Flip it, ([Edit] -> [Transform] -> [Flip Horizontal]), duplicate it and use your move tool to move this new layer to the right.

Use the Free Transform tool to rotate this layer a bit, just to make it a little different. Basically, keep duplicating the layers, flipping them, transforming them, (Rotate, Scale and Distort), and moving them. By changing the layer order, you can control how the leaves overlap each other. Fill in the blank spots. (Figure 7)

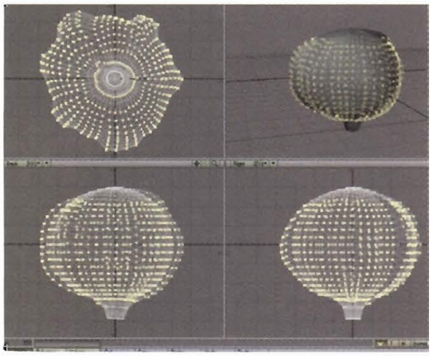

Figure 5

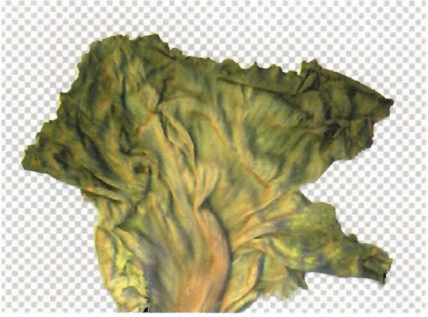

Figure 6

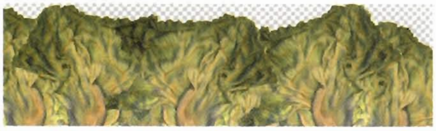

Figure 7

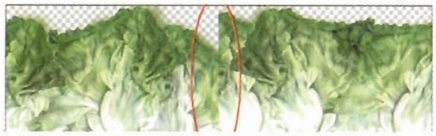

Figure 8

When you are satisfied, save the image in the Photoshop PSD format before you flatten the image. (To merge all of the layers, click on the right-facing triangle at the top right of the Layers panel and select [Flatten Image].

10. You may want to do some Rubber Stamping, Smudging and Hand Painting to add variety to your map and to eliminate any repetition in the pattern. I won't go into the details on how I fixed my lettuce leaf. Basically, I employed a combination of different airbrush options between Overlay, Saturation and Color using a nice clean green or whitish-green color. I also adjusted Hue/Saturation and Levels ([Image] -> [Adjust]).

11. Now we need to scale the image map vertically to fill all of the blank space at the top of Figure 7. [Edit] -> [Transform] -> [Scale] and pull the top middle anchor point straight up. If it starts to look too distorted, stop short and use your Rubber Stamp tool to fill in the rest.

12. Finally, make sure no seam will be visible where the left and right sides of the image meet when it is mapped on the object in LightWave. To view the vertical seam, [Filter] -> [Other] -> [Offset]. Set Horizontal to 750, Vertical to 0, with Wrap Around checked. (Figure 8)

Using your Rubber Stamp tool, rubber stamp the area right next to the seam over the seam area until it looks like it is all blended in. Now use your offset filter again with the exact same settings to put the image back to where it was.

Save the texture map as .psd in case you need to return for further editing. Then save your file in the format you prefer to import into LightWave and name it "lettuce-sides."

Lettuce Top

If we applied the above image to the entire head of lettuce as a cylindrical or spherical map, we would see terrible pinching at the top of the head, totally ruining the effect! So we need to create a separate image map for the top portion of the lettuce.

13. Switch to Layout and load your lettuce object. Rotate it so that the top of the lettuce is facing the camera (Pitch of –90°). In the [Lights] menu, crank the ambient light up to 100% and set its color to white (RGB = 255, 255, 255).

14. Open the Surface editor and select the "lettuce-head-body" surface. Click on [T] next to "Color." Layer Type = Image Map, Blending Mode = Additive, Projection = Cylindrical, Width Wrap = 1.0.

Click on the "Image" drop down menu and [Load Image] and load your "lettuce-sides" image map. Texture Axis should be set to "Y" and click on [Automatic Sizing]. Pixel Blending and Texture Antialiasing should *not* be checked. Click [Use Texture] and make sure Smoothing is turned on.

15. For your Camera Properties set Antialiasing to None and the Resolution to XGA (1024 x 768). Zoom the Camera in on the object so that the lettuce takes up the whole screen. Render. (Figure 9) Save the rendered image as "lettuce-top.tif."

16. Switch to Photoshop and load the rendered image. [Select] -> [Color Range]. At the top of the panel, in the "Select:" box, pick "Sampled Colors." On your image, click inside of the white area. In the dialog box, your selection will show up as white in a black image. Slide the "Fuzziness" control all the way to the left until the only the inside white portion of the image is selected. [OK]. The marching ants now surround the white area as a selection. Save the selection, [Select] -> [Save Selection], name it "lettuce top."

17. Now load the cylindrical lettuce map, "lettuce-sides," and select a chunk of the lettuce using your lasso tool. Copy it [Control-c].

Return to your "lettuce top" image. [Control-v] will paste your selection

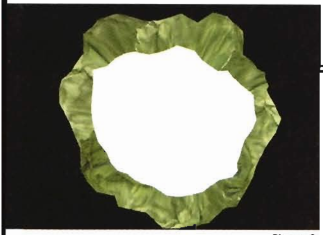

Figure 9

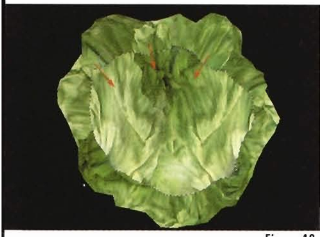

Figure 10

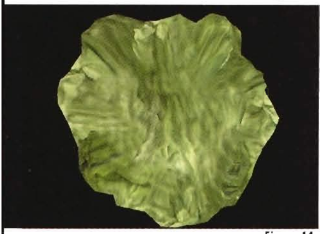

Figure 11

into a new layer and automatically create a layer mask for that layer.

Resize the selection if it does not fill the white area. [Edit] -> [Transform] -> [Scale]. (In Photoshop 4 this would be [Layer] -> [Transform] -> [Scale]).

18. With your lettuce top still selected, double-click your Smudge Tool. Under Smudge Options set the pressure and check "Use All Layers." (In Photoshop 4, since "Use All Layers" is not an option, you will need to flatten your image.) [Window] -> [Show Brushes] and pick a feathered brush of size 35.

To hide the seam, use your Smudge tool, hold down your LMB, start on the outside of the selection and pull pixels from the outside cylindrical map area into the lettuce top area. (Figure 10) Remember that when the Smudge tool is set to 100%, it is very sensitive to mouse movements. So make small steady strokes. You can set the pressure to a lower value, but then the smudged pixels will be a bit blurry. To better see your work, hide the marching ants by pressing [Control-h].

19. To blend it better, I used the Rubber Stamp tool to rubber stamp from the outside area into the lettuce top area. In your Rubber Stamp options, check "Use All Layers" and "Aligned." Be careful not to rubber stamp onto the seam. (Figure 11)

20. Now to crop the image down, make sure your lettuce-top is no longer selected. Go to your Channels panel (the Tab next to Layers) and click on the channel name "lettuce top." You should see a black and white image with the lettuce top portion pure white and the rest of it black. We will use this as a cropping guide. With your Crop tool, drag the area around the white portion of the image. Get as close as you can. To crop, double click inside the area.

Return to the Layers panel and click on the top layer. [File] -> [Save a Copy] and save this as "lettuce-top."

21. It's time to do a test render to see how well you're coming along. So go back to Layout, open your Surface Editor and choose "lettuce-head-top."

Click on [T] next to Color. Layer Type = Image Map, Blending Mode = Additive, Layer Opacity = 100%, Projection = Planar, Image = "lettuce-top," Texture Axis = Y, Automatic Sizing.

[F9] to do a test render. If you need to, go back to Photoshop. (I had to tweak my image map a couple of times before I was satisfied.)

Bump and Diffuse Maps

22. Return to Photoshop and load the original "lettuce-sides" map. Duplicate the top layer and name it "bump." [Image] -> [Adjust] -> [Hue/Saturation]. Move the Saturation slider until it reads –100 and move the Lightness slider until it reads +62. [OK]

Add a new layer and name it "diffuse." Make sure that your foreground color is set to black. With your Airbrush tool, paint in the areas where edges of the leaves might cast a shadow. Also hit the crevices in the leaves to enhance the depth. (Figure 12) With the 2 layers displayed on the screen, [File] -> [Save a Copy] as "lettuce-bump."

Now to display only the "diffuse" layer, [Alt-click] on the Eyeball next to the "diffuse" layer. [File] -> [Save a Copy] as "lettuce-diffuse."

23. We don't want the bump mapping to affect the bottom portion of the lettuce where the core is so we will create an alpha map. Note the height of your "lettuce-sides" image, [Image] menu -> [Image Size].

Create a new Photoshop file, [File] -> [New], 20 pixels wide by the image height of your lettuce-sides image. Hit [d] to change your palette to the default black and white. Now select the Linear Gradient tool and set the gradient option to be "Foreground to Background." Click and hold the LMB at the bottom of the image and pull up about 1/3 of the way and release. Save this as "lettuce-bump-alpha." In LightWave [6] you can add a gradient layer instead of creating this Photoshop image.

Finishing Touches

24. Now [Alt-click] on the Eyeball next to the "lettuce-sides" layer. You should be seeing your lettuce map. Click on that layer. Create a new layer and name it "white gradient." Make sure that white is your foreground color and select the Gradient tool and select the "Foreground to Transparent" option. Move your cursor down to the bottom of the window, click and drag about 1/4 of the way up and release. The bottom portion, where your lettuce core will be, should be mostly white.

25. Create a new layer and name it "rust." Select a brownish rust color in your Color Picker. (I used 134, 109, 40.) Now pick your Airbrush tool and a small brush size (I used brush number 11 counting from the top left of the brushes palette) and set your Airbrush Options to Dissolve and Pressure = 100%. Paint across the bottom of the image map.

Select [Filter] -> [Blur] -> [Gaussian Blur], set the Radius to 2.5 and click [OK]. (Figure 13) With these 3 layers (lettuce-sides, white gradient and rust) showing, Save a Copy as "lettuce-head-body." Also save it as a .psd for future editing.

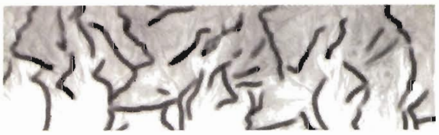
Figure 12

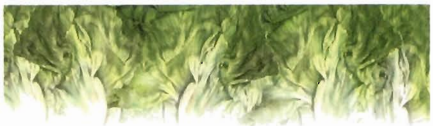
Figure 13

26. Now all we have left to create is the map for the bottom of the lettuce core. Open a new file and size it 350 pixels by 350 pixels.

Using your Elliptical Marquee tool, make a circular selection by holding down [Shift + Alt] and dragging out from the center of the image until the circle fills the whole window. Fill the circle with an orangish rust color. (I used 134,109,40.) Select [Filter] -> [Noise] -> [Add Noise], Amount = 25, Monochromatic.

Pick a nice dark brown (85, 62, 0). Select your Airbrush tool and set the Airbrush Option to Dissolve, 50% Pressure, and a brush size of 45. Paint arcs inside the circle. Pick a burnt orange color (154, 105, 24) and paint more arcs. Now add noise again, this time with an Amount of 4.

Continue picking darker shades of brown with different brush sizes until you get a nice pattern. Also use the Smudge tool with the Pressure set to 25% to smear the pixels around. You also can use the Airbrush set to "Color Burn" to darken areas. Save as "lettuce-core-bottom." (Figure 14)

27. To apply the surface maps, go back to Layout, open your surface editor and select "lettuce head body." Click on [T] next to Color. Layer Type = Image Map, Blending Mode = Additive, Layer Opacity = 100%, Project = Cylindrical, Width Wrap Amount = 1.0. In the [Image] menu, load "lettuce-head-body." "Pixel Blending" and "Texture Antialiasing" should be turned off. Texture Axis = Y. Click on Automatic Sizing. Click on [Use Texture].

Click on [T] next to Diffuse. Layer Type = Image Map, Blending Mode = Additive, Layer Opacity = 20%, Projection = Cylindrical, Width Wrap Amount = 1.0. Load "lettuce-diffuse" as the Image. Texture Axis = Y and Automatic Sizing. [Use Texture]

Set your Specularity to 30% and Glossiness to 40.

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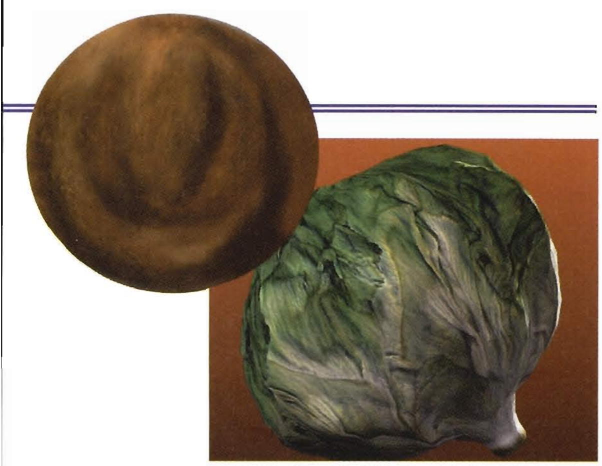


Figures 14 & 15

28. Click on [T] next to Bump Map. There are 3 layers to the bump map.

Layer 1: Layer Type = Image Map, Blending Mode = Additive, Layer Opacity = 100%, Projection = Cylindrical, Wrap Amount = 1.0, Texture Amplitude = 2.0. Load the Image Map "lettuce-bump." Texture Axis = Y, and Automatic Sizing.

Layer 2: Layer Type = Procedural, Blending Mode = Additive, Layer Opacity = 50%, Procedural Type = Veins, Texture Value = 10%, Coverage = .01, Ledge Level = .1, Ledge Width = .1, and the Texture scaling = 10mm (.01) on X, Y and Z.

Layer 3: Layer Type = Image map, Blending mode = Alpha, Layer Opacity = 100%, Projection = Cylindrical, Wrap Amount = 2, Texture Amplitude = 1.0, Image = "Lettuce-bump-alpha," Texture Axis = Y, Automatic Sizing. [Use Texture]

29. Click on the surface name "lettuce-head-top." Set Specularity to 30% and Glossiness to 40. [T] next to Bump, 2 layers to this bump map.

Layer 1: Layer type = Image Map, Blending Mode = Additive, Layer Opacity = 100%, Projection = Planar, Texture Amplitude = 2, Image = "lettuce-top," Texture Axis = Y, Automatic Sizing.

Layer 2: Layer Type = Procedural, Blending Mode = Additive, Layer Opacity = 50%, Procedural Type = Veins, Texture Value = 10%, Coverage = .01, Ledge Level = .1, Ledge Width = .1, Texture Scale = 10mm (.01) on X, Y and Z.

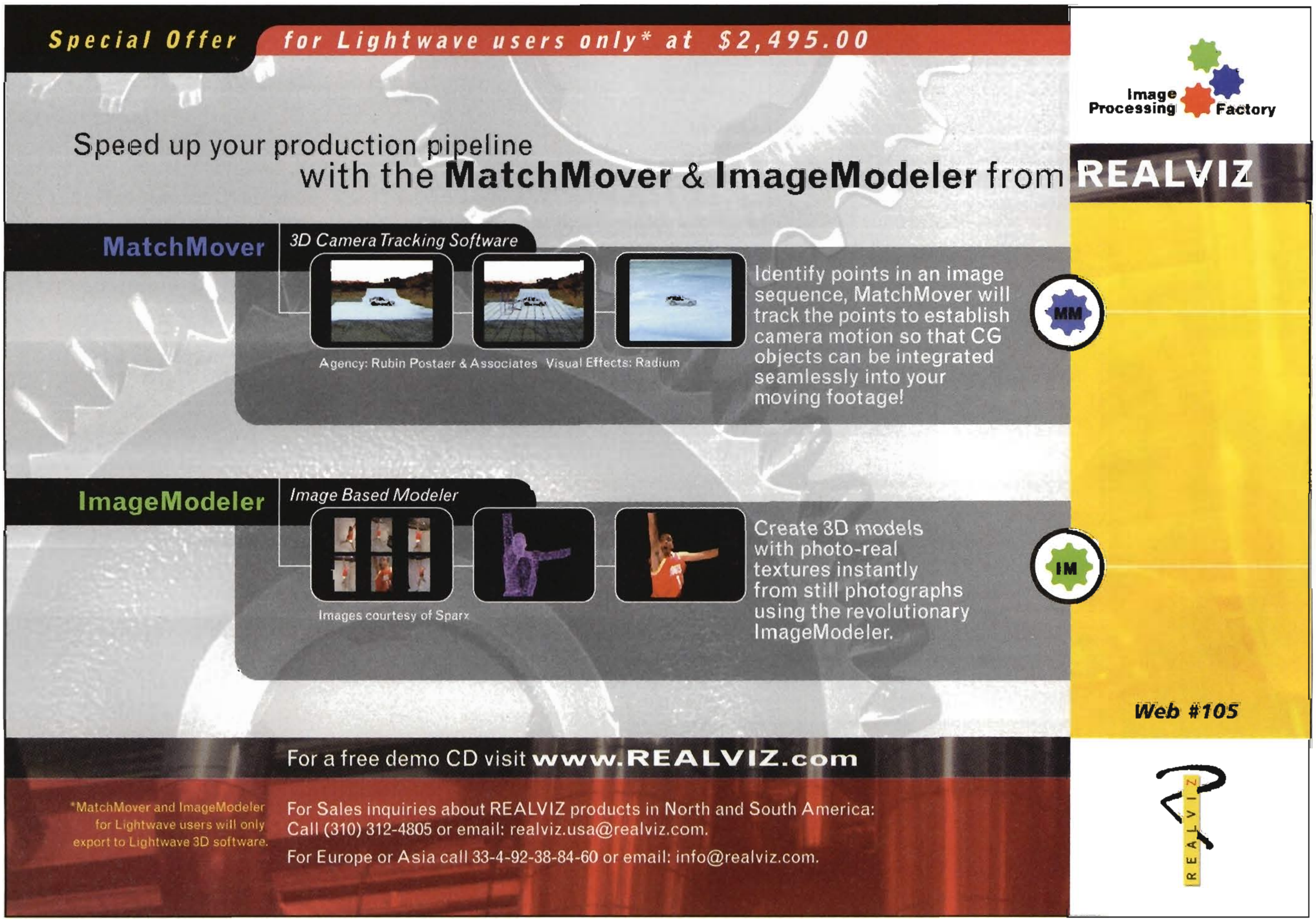
30. And last but not least, the "core bottom" - [T] next to Color. Layer Type = Image Map, Blending Mode = Additive, Layer Opacity = 100%, Projection = Planar, Image = "lettuce-core," Texture Axis = Y, Automatic Sizing.

Take a look at Figure 15 to see my final image.

Well, that's it. I know this was a long tutorial. But remember – if it were easy – everyone would be doing it!

I'd like to say "thanks" to Scott Cameron for being my tutorial tester. (His image is the Lettuce Patch.) Scott's website must hold the largest repository of LightWave tutorials on the web! (http://members.home.com/lightwavetutorials)

Kim Oravecz is a Digital Printing Technician by day and a 3D junkie by night. E-mail her at kimo@en.com or visit her "hopes to be finished one day" website at www.en.com/users/kimo.



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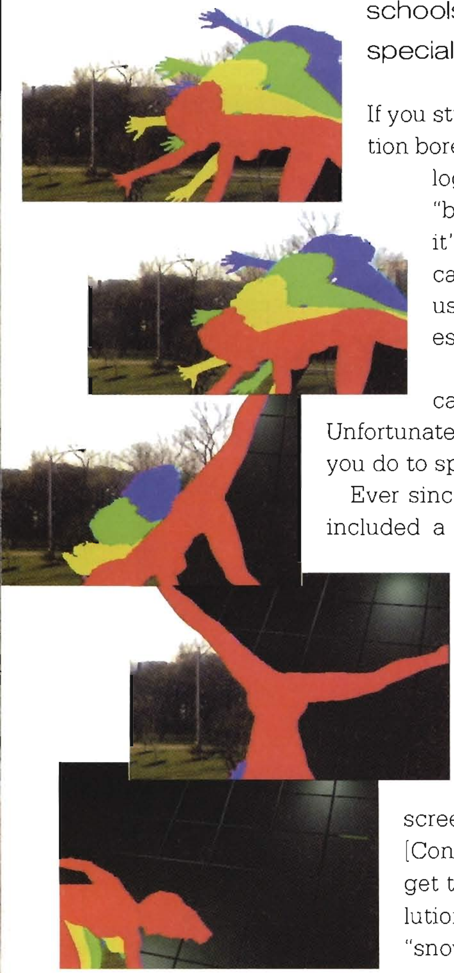
Toast Master FlyingHigh

Multicolored WIPES

by
Bohuš Blahut

I'm sure that I wasn't the only one watching the Sydney 2000 Olympics. While I was riveted by the awe-inspiring and jaw-dropping feats that athletes accomplish with their bodies, I was equally amazed by the jaw-dropping and awe-inspiring graphics. Many of these effects are beyond *easy* reach of our Video Toasters, (though not impossible - ToastMasters can duplicate virtually anything seen on TV using LightWave and a little imagination). Since many stalwart Toaster users capture local sports events for schools and local cable, I started thinking about what special sports effects we can create.

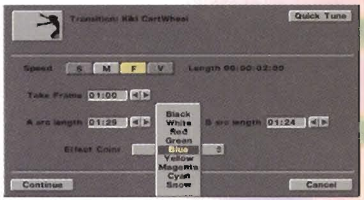


If you studied the Olympic wipes, you noticed that each transition bore both the five-ringed Olympiad and the NBC logo. This logo placement throughout the broadcast is called "branding." With the proliferation of media in the world, it's important for each show to differentiate itself. You can create branding easily in your Toaster productions by using unique and memorable lighting styles, font choices, graphic design elements, or customized transitions.

Clients are crazy about "branded" transitions, but they can be time consuming and expensive to produce. Unfortunately Toaster transitions aren't easy to edit, so what can you do to spice them up?

Ever since the debut of the Video Toaster, NewTek always has included a number of sports-themed transitions. You know the ones: the golf swing, the strong man picking up the barbell, Kiki kicking and more. But Toaster editors have been unable to customize them beyond changing the color of the matte wipe. Even then, with these transitions, 99.9% of folks leave them at their default color of black. But why when you can easily choose from nine different colors for the matte?

In Toaster 3.1, the controls are in the "setup" screen. In the Flyer, you can pick the colors from the effect's [Controls] panel in the storyboard. (Figure 1) And don't forget that last color on the list, "snow." Some of the low-resolution matte effects have obvious jagged edges, which "snow" helps disguise.


Transition: Kiki CartWheel

Speed: S M F V

Length 00:00:02:00

Take Frame 01:00

A src length 01:29

B src length 01:24

Effect Color: Blue

Figure 1

Head Over Heels

We can customize these simple matte effects with a little assistance from two indispensable Flyer tools: *RenderFX* and *joinclips*. These were originally sold by ProWave - a prolific third party company. The newest bug-fixed version of RenderFX is available in the Millennium upgrade brought to us by our friends at Nova Design, www.novadesign.com.

In this mini-tutorial we will layer identical transitions, but offset each wipe by a few frames. The result is one main-colored wipe with multicolored trails. (See the Kiki Cartwheel sequence.)

1. Choose two clips to use with your transition. The usual rule applies - make sure that they contrast well. And remember that the trail effect that we're adding will lengthen the transition time. Make sure the end of Scene A and the start of Scene B have the extra frames needed to complete the longer transition.

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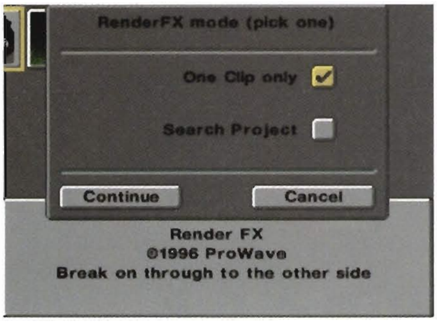
Toast Master Flying High

2. Choose a Toaster transition. I have found that the organic effects are the most interesting, but other more geometric wipes also work well. For this tutorial, we'll put a new spin on the "Kiki Cartwheel." You can find Kiki residing in the "Sports" folder. Drag the transition between the two clips as you normally would. Keep it highlighted.

3. Select a color for the effect by clicking the [Controls] button in the middle of the screen. (Figure 1) Remember that this color will be on the bottommost layer and the other three layers will obscure it somewhat. Now plan your color scheme. I am choosing blue.

4. From the [Tools] popup, select "Render FX." RenderFX will ask you several questions. In the first screen, answer "one clip only." (Figure 2) You can safely accept the default values in all of the other windows.



RenderFX mode (pick one)

One Clip only ☑

Search Project ☐

Render FX
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Break on through to the other side

Figure 2

Once all of that is done, Render FX will go through and permanently render the transition as part of the original scene and generate a new clip. Using my '040 Warp Engine, the render of a two-second transition took approximately three minutes. Once finished, you'll see the transition crouton replaced by a video crouton with the transition "burned" into it. Hit [Play] to check it out.

Here's where the fun begins. The blue cartwheeling Kiki is the bottom layer of what will eventually be a stack of Kiki clones. Before we can add the next layer, we need to fuse the first two croutons together.

5. Highlight the first two croutons and select "joinclips" from the [Tools] popup. "Joinclips" will prompt you to select for a location to save the new clip it will generate. I saved mine in a special folder away from the rest of my project's clips. I named it "sceneA_02".

6. Go get a drink. This crouton melding took a few minutes on my Flyer machine. Now insert the new clip into the project and see how it looks after adding another layer.

7. Delete the first two croutons (the ones that we just joined) in the storyboard.

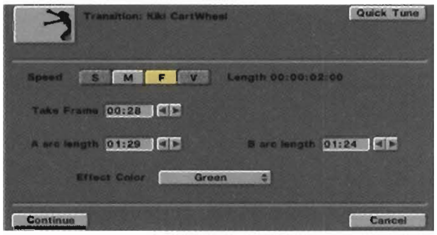
8. Place "sceneA_02" as the first crouton.

9. Go back to the "Sports" folder and get another "Kiki Cartwheel" transition. Place it between the two croutons.

10. Don't forget that we don't want the transitions occurring one on top of the other. We need to offset them by a few frames. So open the [Controls] panel for "SceneA_02" and reduce the [Out] point by two frames. (Figure 3)

11. Open the [Controls] panel for "Kiki Cartwheel." Reduce the [Take Frame] by 2. (In our example the default is 30, but we want it to read 28.) (Figure 4)

12. While still in the [Controls] panel, choose the color of this next layer. I chose yellow.



Transition: Kiki CartWheel

Speed: S M F V

Length 00:00:02:00

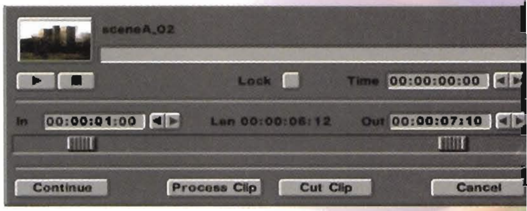
Take Frame 00:28

A arc length 01:29

B arc length 01:24

Effect Color Green

Figure 3



sceneA_02

Lock ☐

Time 00:00:00:00

In 00:00:01:00

Len 00:00:06:12

Out 00:00:07:10

Figure 4

13. Hit [Play]. Now you get your first glimpse of the layered effect. Does it look like colored trails? Does it look like an infinite transition? It all depends on the kind of transition you choose, and the colors that you use for the various layers.

You can tweak the video's [Out] point and the transition's [Take Frame] to adjust the timing if you want to get creative. Different transitions will require more experimentation, and some rudimentary math.

14. Once you have adjusted effect to your satisfaction, highlight it, select "RenderFX" from the [Tools] popup, and follow the above steps again. Once finished, "Joinclips" and save as "sceneA_03." Lather. Rinse. Repeat.

The process becomes simple and automatic once you get the hang of it, and the effect can be quite stunning. In this article, I added four layers of color.

If you don't have a Flyer and you are using a Toaster linear system, you don't have to feel left out. You can achieve this same effect in an online editing suite - you'll just have to do a little tape swapping and accept some generation loss.

As you can see, by using the elements on hand, we can expand our creative horizons. By customizing NewTek's extensive library of effects, we can venture beyond the standard tools. Clients will love the customized "branding" elements you can construct.

Go for the gold.

Bohus Blahut is the director of The Vantage Point and the creator of the Catalyzer tutorial video series. You can email him at bohus@xnet.com

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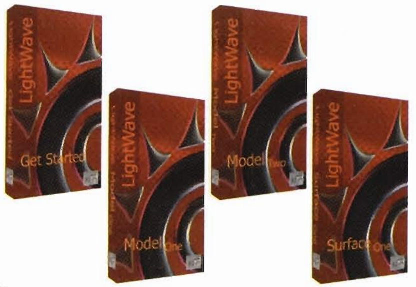

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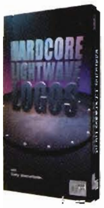

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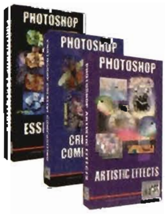

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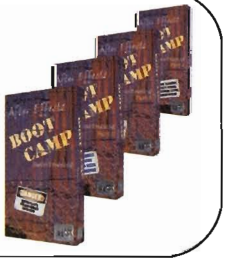

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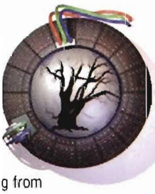

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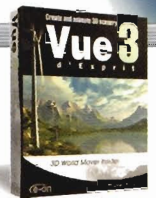

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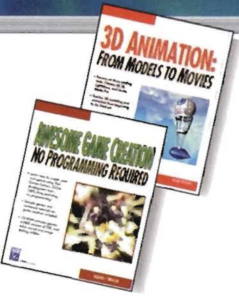

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IT'S GREEK TO ME

Getting to Know LW [6]

by
Jared Brookes

Well, it's about time I did a tutorial that helps to bridge the gap between LightWave 5.6 and LightWave [6]. We'll be constructing a simplified temple, loosely based on Greek architecture. While we build the temple, I'll try to point out some of the differences between LW 5.6 and [6].

1. Let's get started by loading Modeler. First, I have my Perspective view set to "Independent Zoom" and "Independent Center." I'll be turning the grid for the Perspective view on and off as I wish. All of this can be found under [Display] [Options] [Viewports], or by pressing [d] and selecting the [Viewports] tab. Also in the [Display] section, I have set my "Unit System" to [Metric], with a [Standard] "Grid Snap."

We'll begin with construction of the columns. Select [Objects] [Points], and place 3 points down at the following locations:

X:	Z:
1 cm	48 cm
3 cm	44.4 cm
5.5 cm	43 cm

The Points button has been moved from the Tools tab to the Objects tab. If placing the points manually, remember, even if you place a point with the LMB, (left mouse button), when you deactivate the Points tool, Modeler will leave a point behind. Not so in 5.6, the point would only be placed if you used the RMB.

Choose [Multiply] [Mirror] and drag out a bisecting line along the Z-axis at X = 0. Note that if you move the mouse, you can rotate the line of bisection. Deselect [Mirror] to execute the operation (Figure 1). Again, LW[6] differs here in that it automatically executes the operation as soon as you deactivate the tool.

In LW[6], you will notice that every tenth grid line is bolded. In previous versions, only the 0 grid lines were in bold, which served as a quick visual landmark for the origin point of 0,0,0. Hopefully, later versions of [6] will give you the option to turn these additional bolded lines off.

2. Now for the rest of the points for the column object: Click on [Clone] and press [n] for numeric. Set the "Number of Clones" to 19, and "Rotation H" to 18 degrees. Leave the rest of the values at their defaults.

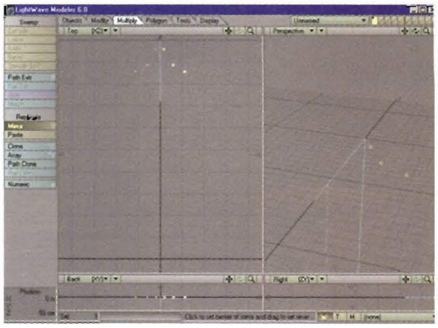


Figure 1

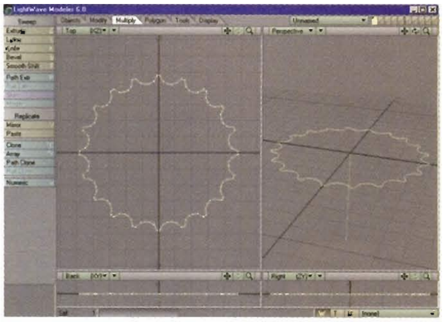
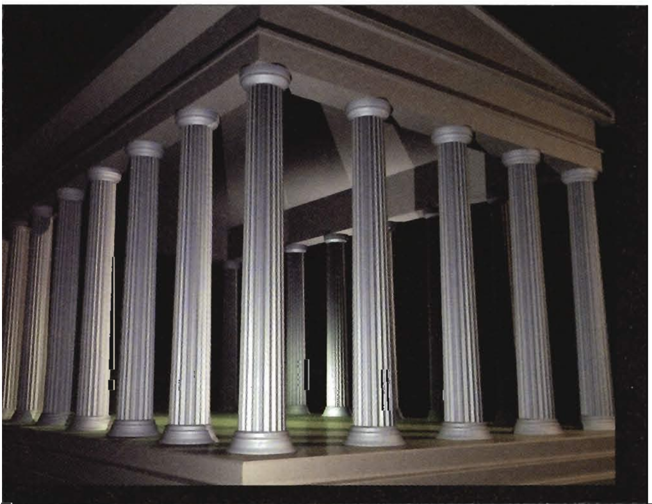


Figure 2



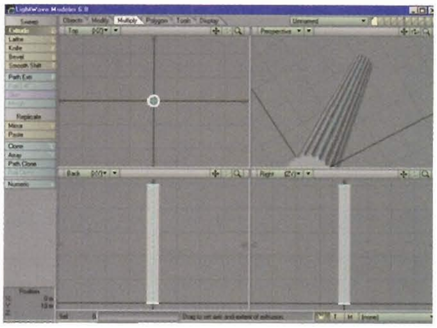


Figure 3

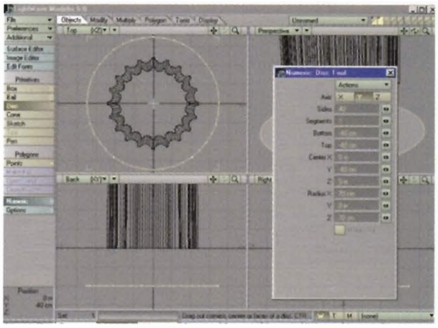


Figure 4

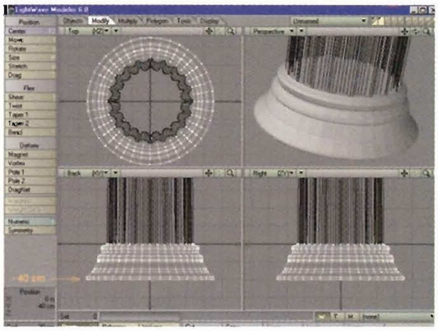


Figure 5

Press [a] to AutoFit the points. Next, select all of them in a counter-clockwise order, and press [p] to turn them into a polygon. Press [Space] or [Ctrl] [h] to switch to Polygons mode (Figure 2).

3. To give this polygon some height, choose [Extrude], click in a view like Back, Front, Right, or Left (depending on how your Modeler screen is configured), and drag up until Y = 7 m.

Release the LMB and click on [Extrude] again to deactivate it. In LW 5.6, you would have been required to first click in the top view, and then drag in the Face or Left view.

Note: Polygons and points now can be selected by clicking on them in the Perspective view. If you want to rotate the view like you did in Modeler 5.6, hold the [Alt] key while dragging in the Perspective view. You also can use [Ctrl] [Alt] LMB drag to zoom in and out.

As an added detail, select the points at the top of the column, click on [Stretch], left-click at the center (0,0) of the Top view, and drag to the left until both the X and Z Scale read 80%. Deselect [Stretch].

4. Okay, next set Layer 2 as the foreground layer, and Layer 1 as the background.

In the Top view, zoom in on the origin (0,0). Select [Objects] [Disc], and click on [Numeric]. Click on [Actions] choose "Activate," and use the following settings: Axis Y, Sides 40, Segments 1, Bottom -40 cm, Top -40 cm; Center: X 0 m, Y -40 cm, Z 0 m; Radius: X 70 cm, Y 0 m, Z 70 cm.

Try click-dragging on the arrows next to "Sides." Notice how the modeling tools have been made more interactive, allowing you to see the changes in real-time (Figure 4). When done, click on the "X" to close the Numeric panel, and click-deselect the [Disc] tool to make the object.

5. Next, we'll use Bevel to finish the shape of the base. Bevel is another example of a highly interactive tool. Whereas in LightWave 5.6, you had to enter values before you could see the result, LW[6] allows you to click-drag the bevels out in a series, and adjust each one with the mouse.

The base shown in Figure 5 was created by first selecting the polygon, selecting [Bevel], and dragging with the LMB. Movements to the left and right will adjust the amount of Shift, up and down affect the extent of the Inset. When you've made the first bevel, use the RMB to create each additional bevel, until the object is done. Feel free to adjust the shape afterwards, using Stretch. The top of the base should end up at Y = 0, with the bottom at Y = -40 cm.

6. For the capital of the column, set Layer 3 as the foreground, with 1 and 2 as background layers. Zoom in on the top section of the column, leaving enough room to place some points for the profile of the capital. Select [Objects] [Points] and drop points down at 0 m on the Z axis and:

X:	Y:
39 cm	7.00 m
39 cm	7.03 m
45 cm	7.07 m
50 cm	7.11 m
53 cm	7.16 m
52 cm	7.18 m
52 cm	7.19 m
54 cm	7.19 m
55 cm	7.20 m
55 cm	7.37 m
0 m	7.37 m
0 m	7.00 m

Place the last point using the LMB (Figure 6), and deselect the [Points] tool. Press [p], and choose [Multiply] [Lathe]. Press [n], click on [Actions] and select "Activate," and use the following: Sides 40, Axis Y, Start Angle 0 degrees, End Angle 360 degrees; Center: X 0 m, Y whatever, Z 0 m; Offset 0 m. Close the Numeric panel and click on [Lathe] again, to deactivate it.

7. To make more of these columns, I'll start by placing the three pieces of the column in the same layer. Select all 3 layers as foreground layers, press [x] to cut them into a buffer, and [v] to paste them down in Layer 1. As well, choose [Objects] [Additional] and [Center] The Additional button has replaced both of the Custom menus that were in LW 5.6.

Great! Now select [Multiply] [Clone], and use the following: Number of Clones 7; Offset: X 0 m, Y 0 m, Z 3 m. Leave the rest of the parameters at their defaults, and click [Ok]. Press [a] to fit the columns into the views, and [Mirror] the column of columns across X = 3 m. Then, select the first and last column on the left, and click on [Clone] (Figure 7).

For this: Number of Clones 3. Offset: X 3 m, Y 0 m, Z 0 m. Click [Ok]. Press [/] to deselect all polygons, choose [Center] from the [Additional] menu again, and hit [a] to fit the columns into the Viewports. Select [Polygon] [Surface], and give these the surface name "Temple Columns."

8. Set Layer 2 as the foreground, and Layer 1 as the background. Select the [Box] tool from the [Objects] menu, toggle [Actions] "Activate" and enter the following:

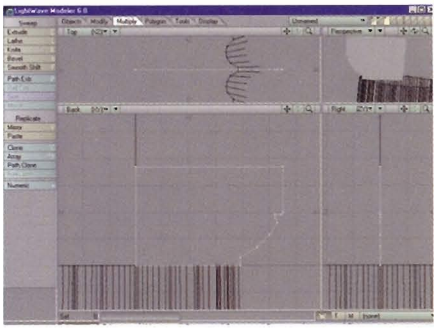


Figure 6

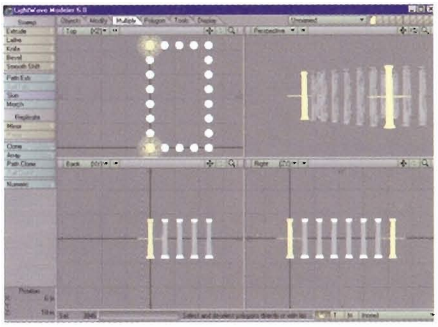


Figure 7

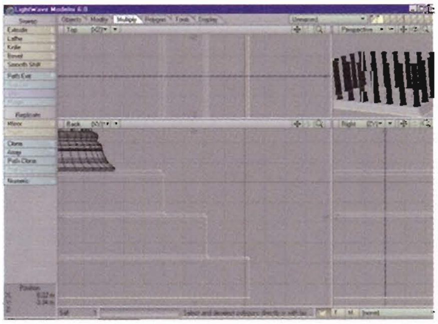


Figure 8

	Low	High	Segments
X	-7.4 m	7.2 m	1
Y	-4.3 m	-3.92 m	1
Z	-12 m	12 m	1

Click [Box] again, and close the [Numeric] panel. Choose the top polygon for the new base object, press [b] for Bevel, [n]. Give it a "Shift" of 4 cm and an "Inset" of 4 cm. Press [/] to deselect the polygon; and this time, choose the bottom polygon for the base. Create the following Bevels:

Shift	Inset
2 cm	-2 cm
0 cm	-38 cm
2 cm	-2 cm
38 cm	0 cm
2 cm	-2 cm
0 cm	-38 cm
2 cm	-2 cm
38 cm	0 cm

Figure 8 shows the edge of the steps when finished.

9. Now that the foundation of the building is done, we can move on to the entablature at top. Place the third layer in the foreground, with the other two in the background. Create a [Box] with the following settings:

	Low	High	Segments
X	-6.5 m	6.5 m	1
Y	8.88 m	4.5 m	1
Z	-11 m	11 m	1

Click [Box] and [Numeric] again, to close them. Select the top polygon of the box, and [Bevel] as follows:

Shift	Inset
0 m	-6 cm
10 cm	0 m
0 m	15 cm
1 m	0 m

Deselect [Bevel] and [Numeric], and place Layer 4 in the foreground, with Layer 3 in the BG. Create another [Box]. This time, use:

	Low	High	Segments
X	-5.5 m	5.5 m	1
Y	3.7 m	6 m	1
Z	-10 m	10 m	1

Close the [Box] and [Numeric] panels, and press ['] to swap layers. Choose [Tools] [Boolean] [Subtract]. This will hollow out the center of the entablature (Figure 9). Press ['] again and [z] to delete the box in layer 4.

10. Now, place points at:

X:	Y:	Z:
7.3 m	5.6 m	-11.1
7.4 m	5.7 m	-11.1
7.4 m	6.1 m	-11.1
20 cm	7.6 m	-11.1

[Mirror] [n] these with Axis set to X. Center to: X = 0 m, Y = 7.4 m, Z = 0 m. Now, "Merge Points," [Tools] [Merge] [Absolute]. This is a rather handy feature, when duplicate points are on the bisecting line. Click on [Points] at the bottom of the screen, press [/] to deselect all, select the points in a clockwise order, and press [p] to make them into a polygon. [Extrude] the polygon along the Z axis, 22.2 m.

11. For the last bit of detail, the pediment, in [Polygons] mode, select the two end polys and press [b], and use these values:

Shift	Inset
0 m	15 cm
1 cm	1 cm
20 cm	0 m

Deselect [Bevel] [n], and press [/]. Choose layers 3 and 4, press [q] and name this surface of the object "Temple Top." Next, make Layer 1 the foreground, and give this the surface [q] name "Temple Base."

Select all four layers as foreground layers, and move the temple up so that the base is flush with Y = 0. Finally, select [Tools] [Merge] [Absolute], just in case any overlapping points managed to slip in.

Good. Now we're ready to save the temple object. Object saving in

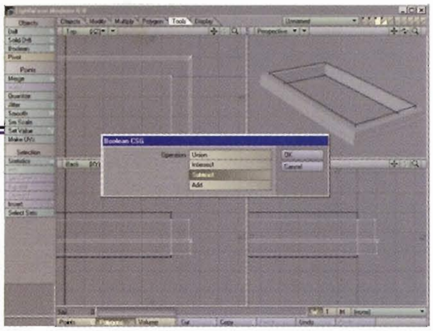


Figure 9

LightWave Modeler 6 is very different from LightWave 5.6. First, each bank of layers now represents one object. Hence, you can have a bunch of objects — each with their own layers. These layers stay intact in Layout, and can be manipulated in much the same way as separate objects were in 5.6.

In Modeler 6, you need to specify which layers you want to have visible in Layout. Do this by selecting [Display] [Layers], and clicking on the little white arrow next to the object name, which will reveal all of the layers for that object. Next, for each layer that you want visible in Layout, a little dot should exist next to the layer (underneath the eye icon).

If the layer doesn't have a dot to the right of it, it won't show up in Layout. However, it still will show up the next time you load the object into Modeler.

So, make sure that Layers 1, 2, 3, and 4 all have dots next to them, and either save the object by selecting [Objects] [File] [Save Objects As...], or by pressing [Shift] [Ctrl] and choosing [File] [Save Object As...]. Name the object "Temple01.lwo," and save it in a folder called "Temple," inside the "LightWave/Objects" directory. Another difference here is that LightWave now stores its files in a directory called "LightWave," instead of in the "NewTek" folder.

12. Okay, load up Layout. The first thing you'll notice is that buttons and panels have moved around quite a bit. The [Objects], [Bones], [Lights], and [Cameras] buttons have been moved to the bottom of the screen. No longer are objects loaded through the Objects panel. Instead, they are loaded and saved through the [Add] button on the [Actions] menu.

Something should look awfully familiar about this interface. When I first saw LightWave [6], I made the connection pretty quickly. Layout has been redesigned to reflect the interface used in Modeler. Objects, Bones, Lights, and Cameras are treated much like the various modes in Modeler (Points, Polygons, etc.). The tabs across the top determine which features will be available at the left-hand menu.

Load the building we created by clicking on [Add] [Load Object...] and double-click on the "Temple.lwo" file.

Drag the [Perspective] button down and select Camera view. Click on the [Cameras] button at the bottom of the screen, to give us access to the translation tools for the camera. [Move] the camera to: X -14 m, Y 2.5 m, Z -22.5 m. [Rotate] it to: H 37.00 degrees, P -11.00, B 0.00. Click on [Create Key], and [Ok] to keyframe the camera at frame zero.

Hit [p] to open the Camera Panel, and widen the lens by lowering the "Zoom Factor" to 3.0. While we're here, choose a resolution, and set "Antialiasing" to "Enhanced Low." To close the panel, either click on the "X" at the corner of the window, or press [p] again. This goes for all panels in LightWave now (no more [Close] buttons).

13. Let's begin by adjusting the building's surfaces. Select [Surface Editor], and click on the white arrow next to "Temple01," to reveal its surface names.

Click on "Temple Base," and give it the following surface attributes: Color R 205, G 205, B 194; Specularity 20%, Glossiness 5%, Reflection 20%.

Leave the rest at their defaults, and click on the [T] next to Bump. In LW[6], you need to specify whether you will be using an Image Map, a Procedural, or a Gradient. Let's switch "Layer Type" over to "Procedural Texture," and drop the "Texture Value" to 15%. Set the [Scale] to: X 3 cm, Y 20 cm, Z 3 cm.

Click [Use Texture], press [c] to copy the texture parameters, and choose "Temple Top" as the current surface. Press [v] to paste the stored texture parameters into this surface. Lower the "Specularity" and "Reflection" to 5% each, and click on the [T] next to the Bump channel. Raise the "Texture Value" up to 30%, to increase the visibility of the bump pattern, and select [Use Texture].

Finally, select the "Temple Columns" surface, press [v] to paste the "Temple Base" texture settings into it, and change the Color to: R 194, G 205, B 202. Set the "Glossiness" to 20%, "Reflection" to 5%, and check "Smoothing."

Go to the Bump [T] channel. Set the "Texture Value" to 25%, [Size] to: X 3 cm, Y 3 cm, Z 3 cm. [Use Texture], and click the [T] next to "Color." Set "Layer Type" to "Procedural Texture." Select "Marble" from the "Procedural Type" menu, assign the "Texture Color" to: R 188, G 196, B 220, the "Texture Axis" as [Z]. Use a [Scale] of: X 3 m, Y 30 cm, Z 6 m. [Use Texture] and close the [Surface Editor].

14. Switch to [Lights] mode, press [p], and change the "Light Type" to "Spotlight," with a "Spotlight Cone Angle" and "Spotlight Soft Edge Angle" of 70 degrees. Next, click on [Global Illumination] and reduce the "Ambient Intensity" to zero. Close the Lights panels.

[Move] the light to: X -10.5 m, Y 2 m, Z -15 m. [Rotate] it to: H 48, P -15, B 0 degrees. Press [Enter] twice to keyframe the light at frame 0.

When you are ready, click on [Render], check "Ray Trace Shadows" and "Ray Trace Reflection." Set "Render Display" to "Image Viewer," and press [F9]. I've added a few extra lights, and played around with light colors and Intensity Falloff.

Now hopefully, you are more comfortable with LightWave [6]; and you will find the transition from 5.6 to 6.0 an enjoyable one. Have fun with all the new features!

Jared Brookes is a freelance 3D Modeler/Animator and analog synthesizer programmer, currently based out of Calgary, Canada. Feel free to check out the music and computer-generated images on his web sites "Synthetic Reality" and "Voltage Control" at: www.blitter.com.

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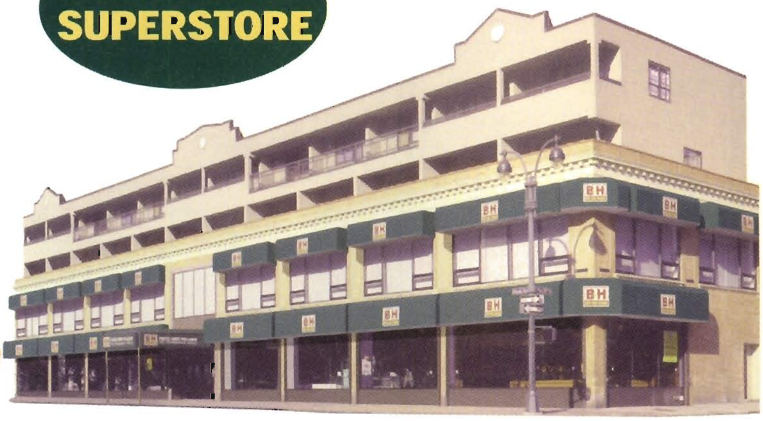

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- Applies JVC's DSP with advanced 14-bit video processing to bring out more natural details, eliminate spot noise, accurately reproduce dark areas, and restore color information in dark areas.
- CCDs are equipped with advanced circuitry to virtually eliminate vertical smear when shooting bright lights in a dark room. Ensures efficient light conversion with a sensitivity of F11 at 2000 lux
- CCD Defect Correction function evaluates white defects with the lens closed and then stores their addresses in memory. When the camera is turned on, the data is sent to the DSP for storage and real-time correction.
- Black Stretch/Compress function ensures accurate reproduction of black areas on the screen. Advanced color matrix circuits give even difficult images a very natural appearance.
- Multi-stream parallel digital pipeline processing at 40 MHz creates an ultra-smooth gamma curve, calculated using a true log scale algorithm. The result is a dynamic range of 600% to accurately reproduce fine details and colors in shadows or highlights.

Professional Performance

- Multi-zone iris weighting system gives priority to objects at the central and lower portions of the picture for accurate auto exposure under any condition, even if a bright subject moves into the picture.
- Adjustable gamma for adjusting the "feel" of the picture according to taste. Adjustable detail frequency for setting picture sharpness for a bolder or finer look.
- Viewfinder status display uses characters and menus to diplay selected information, including audio indicator, tape and battery remaining time, VCR operation and warning indicators. Camera settings and setup parameters can also be checked at a glance. A built-in menu dial lets you quickly navigate through the viewfinder menu.
- Highlight Chroma Processing maintains color saturation in highlights. The result is natural color reproduction, even in bright highlight portions of the picture.
- Smooth Transition mode ensures a smooth transition with no jump in color or light level taking place when manually changing gain or white balance settings

Professional Audio

- To complement its superior video performance, the GY-DV500 offers outstanding digital PCM sound. You can choose between two 16-bit 48-kHz channels or two 12-bit 32-kHz channels with a dynamic range of 85 dB.
- In addition to camera mounted mic, has two XLR-balanced audio inputs with 48v phantom power and manual audio control. Phantom power can be switched off when not in use.
- Side-mounted speaker lets you monitor audio in playback and recording modes without headphones. The speaker also delivers audible warnings.

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SONY

QUICK DIAL 74

DSR-250 3-CCD DV & DVCAM

Introducing everything you need in an event camera and more. The new completely digital DSR-250 from Sony is a high image quality reduced size camcorder which has been optimized for shooting events and parties. Every feature you could want is included in this revolutionary acquisition tool.

- **1/3 inch x three 380K pixel** (effective 340,000 pixels) **CCD's** that allow two scanning modes: 480 progressive (for still) or interlaced (for video). They also provide high quality acquisition with increased resolution and sensitivity at reduced noise and vertical smear.
- **530 lines of horizontal resolution,** allowing you to capture your subject with tremendous detail.
- **Switchable aspect ratio** 4:3 (TV mode) or 16:9 (Movie mode)
- **DXF-801 high resolution 1.5" black & white viewfinder** (same as on DSR500/1 & DXC-D35) enables easier focusing. Automatically switches from 4:3 aspect to 16:9.
- **Records in DVCAM or DV,** standard tapes or mini. Up to 270 minute recordeding in DV mode onto a 184 min. DVCAM tape.
- One touch auto focusing in manual focus mode.
- Manual or automatic functioning: Focus, Iris, Shutter-speed, Zoom, Gain (3 positions and memory).
- **Flip out 2.5"** 200,000 dot **LCD monitor,** finally available on a professional camera • Time date stamp.
- **58mm lens** with **12x optical zoom**.
- **Advanced optical stabilization** allowing for a high quality digital zoom out to 24x, with a maximum digital zoom out to 48x
- **Assignable time code** (Rec Run, Free-run, User-bit)
- 16 bit 2 channel audio recording, or 12 bit 4 channel.
- **Digital in/out** (IEEE1394) and **analog in/out.**
- **Still image capture onto memory stick** • Upload graphics from memory stick or USB adapter, software included
- Phantom 48V power • Built in speaker • Directional microphone in pro mic holder, 2 XLR audio inputs
- **Built in edit controller.** Equipped with an i.LINK interface, allowing camcorder to serve as edit player or recorder.
- Soft shoulder pad. • **Wireless remote controller.**
- Uses sony's lithium Ion batteries (BPL series).
- External 12V supply/Connection for light. The DSR-250 is equipped with light output (DC 12 V, maximum 30 watts).

DSR-300A
3-CCD Digital (DVCAM) Camcorder

Inheriting many of the same features and functions as the DSR-130, the affordable DSR-300A actually extends operational convenience with a range of new features and peripheral products. Remarkably compact and lightweight, the improved DSR-300A provides high mobility without compromising picture quality and can be held comfortably on your shoulder through the longest shoots and gives videographers the ability to acquire their footage quickly and easily.

- The DSR-300A has three 1/2" IT Power HAD CCDs to deliver 800 lines of horizontal resolution, 62dB S/N ratio and high sensitivity of F/11 at 2000 lux.
- Power HAD CCDs also gives you a low smear level of -110 dB (DSR-300) allowing more freedom to shoot highlighted subjects
- With built-in 26-pin VCR interface, they can feed composite or S-Video output signals to an external recorder for parallel or back-up recordings. VCR recording modes including Parallel, Internal (only) and External (only) are selected via the trigger switch positioned on the operational panel
- With the DSR-300A, a picture previously recorded on tape can be superimposed on the viewfinder screen (Freeze Mix Function), allowing you to easily frame or reposition the subject just as in the previous shot. Combined with the SetupLog function, the retake shot becomes a breeze
- LSI Digital Signal Processor (the very same one used by the DXC-D30 cameras) for a high signal-to-noise ratio of 62 dB.
- Both mini cassettes (PDVM series) and standard cassettes (PDV series) can be used with the DSR-300A. With PDV-184ME (standard), a maximum recording time of 184 minutes can be acheived. They can also play back tapes recorded in the consumer DV format
- For operational convenience while shooting, the Time Code is superimposed on the viewfinder screen or MONITOR OUT screen, even during playback
- DXF-801 viewfinder featuring variable peaking, 3 level tally light and a white LED light with 2 levels of intensity to illuminate the lens setting • IEEE1394 i.Link (out only)
- Color Temperature Shift allowing the operator to manually shift the white balance either towards blue or red to compensate for conflictive (color temp mix) and because of the wide range it also provides creative artistic painting.

DSR-20/40 DVCAM Player/Recorders

The DSR-20 and DSR-40 are versatile DVCAM VCRs with compact chassis' and a variety of convenient functions for recording, playback and simple editing. They feature Auto Repeat Playback, Power-On Recording/Playback, multiple machine control interfaces and i.Link (IEEE1394) input and output. And, of course, they offer the stunning image and sound quality inherent to the DVCAM format.

- **i.LINK** They both offer i.LINK ((IEEE1394) input/output. In addition, in the "Digital dubbing including TC Copy" mode, full information of video, audio and time code of the original tape can be copied to another tape. Especially useful when making working copies of the original.
- **Inputs and Outputs**They provide a full range of analog video inputs and outputs for integration into current analog-based systems. They both offer composite and S-Video input/output, while the DSR-40 (only) offers a component output as well. The DSR-20 is equipped with analog audio inputs and outputs (RCA), the DSR-40 with RCA inputs and XLR-balanced output. These connections in combination with their i.LINK interface allow a smooth transition to an all digital system in the future.
- **Record/Playback Functions** Automatic repeat function for repeated playback. After reaching the end of the tapet, the DSR-20/40 automatically rewinds the tape, then starts playing back the segment again.
- They are capable of searching for Index Points, which are recorded on the tape as "in-point" marks every time a recording starts. They can also search for photo data recorded on a DVCAM cassette by the DSR-200A/300/PD-100, or where the recording date has been changed.
- **Reference Input** External sync input enables synchronized playback with other VCRs. Especially important in A/B Roll configurations. In addition, the DSR-40 only allows adjustment of H-sync and SC phase via the menu.
- **Control S Interface** The DSR-20/DSR-40 have a Control S input allowing control via the optional DSRM-20 Remote Control.
- The DSR-20 adds a **Control S output** connector allowing two or more (up to 50) DSR-20s to be daisy-chained and controlled from one DSRM-20.

DSR-20 Only • The DSR-20 can be powered by AC or DC.
- Equipped with Control L interface, the DSR-20 can perform simple Time Code-based editing when connected to another DSR-20 or other similarly equipped VCRs/cameras.
- In addition to Control L, the DSR-20 also incorporates an RS-232 interface for remote control of basic VCR functions from a PC.
- Supplied with the RMT-DS20 Wireless Remote for control of basic VCR functions.

DSR-40 Only • Equipped with an RS-422A interface, it can perform as the editing player in A/B roll or cut editing system.
- It also has a simple recording function which can be controlled either manually or via its RS-422A interface.
- The DSR-40 is not equipped with a synchronization capability, the editing accuracy is performed by pre-roll and play.

DSR-30 DVCAM Digital VCR

The DSR-30 is an industrial grade DVCAM VCR that can be used for recording, playback and editing. DV standard 4:1:1 sampling digital component recording with a 5:1 compression ratio provides spectacular picture quality and multi-generation performance. It has a Control L interface for editing with other Control L based recorders such as the DSR-200A DVCAM Camcorder or another DSR-30 . It also has a continuous auto repeat playback function making it ideal for kiosks and other point of information displays.

- Records PCM digital audio at either 48kHz (16-bit 2 channel) or at 32kHz (12-bit 4 channel) .
- Equipped with Control L, capable of SMPTE Time Code based accurate editing even without an edit controller. Built in editing functions include assemble and separate video and audio insert .
- By searching for either an Index point or Photo Data recorded by the DSR-200A camcorder, the DSR-30 drastically cuts the time usually required for editing. The DSR-30 can record up to 135 Index points on the Cassette Memory thanks to its 16K bits capability.
- Audio lock ensures audio is fully synchronized with the video for absolute precision when doing an insert edit.
- Built-in control tray has a jog/shuttle dial, VCR and edit function buttons. The jog/shuttle dial allows picture search at ±1/5 to 15X normal speed and controls not only the DSR-30 but also a player hooked up through its LANC interface
- DV In/Out (IEEE 1394) for digital dubbing of video, audio and data ID with no loss in quality.
- Analog audio and video input/outputs make it fully compatible with non-digital equipment. Playback compatibility with consumer DV tapes allows you to work with footage recorded on consumer-grade equipment. Tapes recorded in the DSR-30 are also compatible with Sony's high-end DVCAM VCR's.

Apple Authorized Reseller

Power Mac G4

Simply the fastest desktop computer ever, the G4 is designed for creative professionals who use computers as the pivotal tool of their trade, setting the pace of their work, their productivity, even their success. It features the revolutionary PowerPC G4 with Velocity Engine, which crunches multimedia data at blazing-fast speeds. The Velocity Engine uses true independent vector processing-a technology originally developed for use in scientific supercomputers. The result is unprecedented productivity for creative professionals-in the arts as well as the sciences. With its Pentium-crushing speed (easily running up to a stunning 50% faster than a 1000MHz Pentium III-based PC.) the new Power Mac G4 picks up where the best-selling original Power Macintosh G4 left off.

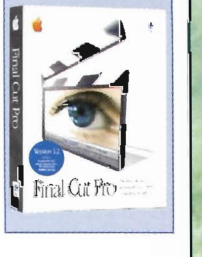
Features
- 1 MB of backside level 2 cache running at half the processor speed
- ATI RAGE 128 graphics card with 16MB of graphics memory supporting up to 1200x1600 resolution
- Support for up to 1.5GB of PC100 SDRAM
- Support for more then 200 GB of internal hard disk storage
- Four expansion slots including Three 64-Bit PCI slot and one Graphic card slot
- Two 400-MegaBit-per-second FireWire ports for connecting Digital Video Cameras, hard disk drives and other high speed multi media peripherals
- Two USB (Universal Serial Bus) ports for connecting up to 127 peripherals

G4/400 (M7891LL/A)
- 400MHz processor speed
- 64 MB SDRAM memory
- 20GB ultra ATA/66 Hard Drive
- DVD-ROM Player
- Two firewire 400-Mbps ports
- Two USB 12-Mbps ports
- 10/100/1000 BASE-T Ethernet card • Built-in 56K modem

G4/450 (M7892LL/A)
- Dual 450 MHz processors
- 128 MB SDRAM memory
- 30GB ultra ATA/66 Hard Drive
- DVD-ROM Player
- Two firewire 400-Mbps ports
- Two USB 12-Mbps ports
- 10/100/1000 BASE-T Ethernet card

G4/500 (M7893LL/A)
- Dual 500 MHz processors
- 256 MB SDRAM memory
- 40GB ultra ATA/66 Hard Drive
- DVD-RAM (5.25 GB) recorder
- Two firewire 400-Mbps ports
- Two USB 12-Mbps ports
- 10/100/1000 BASE-T Ethernet card

Final Cut Pro Professional Editing, Compositing and Effects Software for Macintosh



A breakthrough in non-linear video. Final Cut Pro combines professional editing, compositing, and special effects in one powerful application— turning a Power Macintosh into a powerful workstation. Designed from the ground up for DV. Final Cut Pro offers the easiest way to transfer material from DV sources to your hard disk; edit, composite, and add effects to the video and audio; and play the results. It has an advanced feature set that professionals will love, yet it's also easy enough for novice video producers who are just discovering DV and FireWire.Final Cut Pro supports DV and all QuickTime formats, including M-JPEG and web-ready streaming video. It provides plug-and-play capabilities with most digital video cameras. It supports unique DV features such as non-square pixels and audio/video interleaving. Just connect your computer to a DV camcorder, capture video and edit it with sophisticated tools such as three-point editing, match frame, and multitrack trimming. Create multiple layers of video using text, graphics, or additional video elements. Each layer can be still, or animated along a user-defined path using tools such as Bézier curves with acceleration control. Apply time-varying filter effects, such as blur, to any layer, and mix and synchronize multiple audio tracks—up to 99 tracks per movie. Then you can output your results for TV, videotape, QuickTime movies, or the Web.

Final Cut Pro is Compatible with the Pinnacle MiroMotion DC30 for analog capture. And with the Aurora Igniter Card for analog and Component capture.

989.95

Good System..4,899.95
Includes:
- Apple G4/400 Computer
- Final Cut Pro version 1.25 editing software
- Total of 192MB of memory
- Additional 45GB of ATA/66 storage
- Final Cut Tutorial CD
- Mitsubishi Diamond Pro 2040 22" Monitor
- Apple Care-three year warranty
- Complete System integration and testing

Great System .5,995.00
Includes:
- Apple G4/450 Dual Processor
- Final Cut Pro version 1.25 editing software
- 75GB of ATA/66 storage
- Total of 256MB of memory
- Final Cut Tutorial CD
- Mitsubishi Diamond Pro 2040 22" Monitor
- Apple Care-three year warranty
- Complete System integration and testing

Best system ...8,995.00
Includes:
- Apple G4/500 Dual Processor
- Final Cut Pro v1.25 editing S/W
- 150GB (2x75) of ATA/66 storage
- VST Ultratrek 66 IDE controller card
- ATI Rage Orion dual display card
- Total of 256MB of memory
- Artel Boris FX 5.0 Effects program
- Final Cut Tutorial CD
- 2 Mitsubishi Diamond Pro 2040 22" Monitors
- Apple Care-three year warranty
- Complete System integration and testing

Optional Accessories

45GB 7200 RPM Ultra ATA/66 Hard drive	299.95	75GB 7200 RPM Ultra ATA/66 Hard drive	719.95
EZ-Quest 30GB 7200 RPM Ext. Firewire drive	499.95	EZ-Quest 60GB 7200 RPM Ext. Firewire drive	799.95
128 MB memory module	199.95	256 MB memory module	399.95
Imation 3.5" Floppy Drive	84.95	Keyspan USB to Serial Adapter	89.95
Griffin iMate USB-ADB Adapter	54.95	Apple Final Cut training CD	129.95

PINNACLE
SYSTEMS

CinéWave

CineWave includes:
- Commotion Pro • Apple Final Cut Pro
- Hollywood FX Bronze

Pinnacle Systems CineWave is the revolutionary new non-linear editing package that delivers the power of true uncompressed video with Apple's Final Cut Pro. Using Pinnacle's new HUB3 video processor, the CineWave combines infinite layering, incredible effects, advanced compositing tools and accurate motion tracking with all the major video formats in compressed or uncompressed video. Based on the new dual processor Apple G4's, CineWave delivers the worlds first scaleable desktop video system capable of outputting both Standard Definition and High Definition simultaneously.

CineWave delivers compressed or uncompressed video and balanced or unbalanced audio ranging from NTSC/PAL, CCIR-601 or HD, YUV or RGBA, 4:2:2 or 4:4:4:4, interlaced or progressively scanned, using aspect ratios of 4:3 or 16:9 to output to tape, CD, DVD or streaming media files using Pinnacle's unique memory-centric architecture. The CineWave also has real-time 3:2 pull down for 24-30fps conversion. At the base of this system is Pinnacle's new Targa Cine Engine with two Digital Tether ports for plug and play capabilities to easily upgrade the CineWave from analog to serial digital or from standard definition to high definition with optional breakout boxes.

DigiEffects
Cinelook
Film Simulator Plug-in for Adobe Effects

Cinelook is a revolutionary tool that takes any video, computer animation, film-scan or photo and allows you to add grain, correct color and add film artifacts like dust, scratches, stains, hair and more. Cinelook is designed for video producers who needs to match video footage or 3D animation with film footage or to get that "film look" by adding film-grain to video or computer animation. It can also reduce film grain to better integrate scenes in film production. Cinelook allows you to take any video footage (S-VHS, Hi-8, Betacam SP, DV) and make it look like film by emulating all of the popular film-stocks and performing advanced color correction. It uses the enhanced timing controls in After Effects to convert 30 fps footage to 24 fps in order to simulate 35mm and 16mm film, and 12 fps for 8mm film. This process in known as "inverse-telecine" and is integral to achieving the "film look". CineLook uses several other technologies, including StockMatch, which adds grain to the RGB channels separately, Chromamatch, a color matching and correction system. And TimeMatch an advanced time matching system, that simulates the shutter blur of film thus creating a softer, more filmic appearance to video footage than what can be achieved by AE.) Cinelook is available in two versions, Broadcast and Film Res. And is available for both Windows and Mac.
Broadcast version limited to 768 x 576 pixels (D1).
Film Res version adds a de-grain filter, and works up to 4K by 4K resolution. **$659.95**

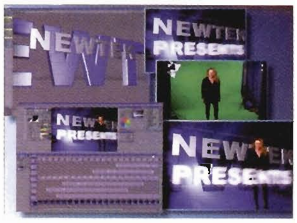
Delirium Plug-in for after effects

An amazing set of plug-ins for After Effects, Delirium has over 45 separate tools that will make your video and motion graphics work stand out. Create natural phenomenon like snow storms with flakes that fall naturally on any logo or image. Or generate spectacular particle-based "fire" and "smoke" as well as lens flares, motion graphic elements, gun muzzle flashes, lighting effects and much more! **$549.95**

Cinemotion
Tools for Simulating Film Motion, Controlling Noise and More

CineMotion is a set of 10 plug-ins for After Effects MacOS that allows you to take any video footage (S-VHS, Hi-8, Betacam, DV) and make it move like film, reduce or enhance grain, diminish interlace flicker, create film-aspect ratios, perform posterization effects and lessen color banding artifacts.
All plug-ins have presets, so you can get started quickly. You can also save your own presets, and trade them with others or use the on other projects. CineMotion was designed to allow video producers to give thier productions the motion of film with complete flexibility and control.CineMotion is a great companion to DigiEffects award-winning product, CineLook. The Film Motion plug-in creates a much enhanced version of the standard 3:2 pulldown for After Effects. **$279.95**

Video Toaster
Tools for Broadcasting and Beyond



With a suite of tools for video creation including all the essential components for video editing, compositing and 2D/3D animation, the Video Toaster is an uncompressed D1 (composite, component, Y/C) Windows NT solution that offers a price/performance equation unmatched in the industry. Unique to the Video Toaster is a breakthrough technology developed by NewTek that turns a standard Pentium II or III processor into a highly specialized video DSP (digital signal processor) for time base correction and other capabilities typically associated with expensive custom chipsets. Superior to systems that cost tens of thousands of dollars the Video Toaster includes LightWave VT 3D animation software, Aura paint and compositing software and in-syncs Speed Razor 4.5 SE video editing software. Leveraging over 12 years of experience as an industry leader and pioneer in the desktop video, 3D, and 2D paint and animation markets, NewTek has created a product that contains award winning tools for creating better than broadcast quality television....at an unbeatable price!

Uncompressed Video— No Compromises

- The Video Toaster offers quality that's second to none. ALL video is ALWAYS stored in its native, uncompressed D1 video format. Unlike other boards that show compression artifacts, the Video Toaster maintains the original pristine quality no matter how many layers in your project.
- The Video Toaster allows you to manipulate uncompressed video in many ways, including traditional 2D compositing, rotoscoping, 3D animation and modeling and editing. By merging video into a 3D compositing and animation environment, editors will find a new paradigm for video effects and manipulation. The quality and capabilities of the Toaster are comparable or better than digital video editing costing $50,000 to $100,000.
- The Toaster provides an uncompressed D1 (composite, component, Y/C) digital video solution typically associated with extremely expensive systems. High-end facilities know that uncompressed digital video is essential to the editing process. Most compression-based systems are elegated to industrial and corporate video segments due to restrictions on the number of layers and quality degradation associated with multi-pass compression. All compressed systems produce unwanted artifacts. Because the Toaster utilizes uncompressed video, you can infinitely layer video without any concern about artifacts. This is the major separation between high-end and mid range systems. The Toaster brings that ultra high-end sophistication to users at levels at an unprecedented price point.

Powerful Editing

Video Toaster includes in-sync's powerful editing application, Speed Razor 4.5 SE.

- Project timeline that lets you easily create professional video projects containing unlimited layers of video, audio, still image files and animation.
- Comprehensive 2D compositing system
- The ability to capture, edit and output to uncompressed video and other formats, including ASF for video streaming on the Web and multimedia AVIs.
- Graphical workspace for digital media content management
- Real-time on-screen preview of edits
- Power character generator (CG).

Toaster Utilities

VT Director—Allows any program that supports cut and paste to display an image on a NTSC or PAL video monitor. Imagine working in Photoshop and being able to display your work on a video monitor with one keyboard shortcut.

ToasterVision—Allows you to preview both video input and output as well as animation on your RGB monitor at 720 x 480 resolution and full frame rate—60 fields per second.

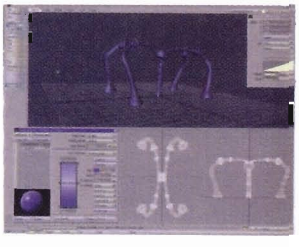
ToasterScope—Keep your video legal as you work on it. The built-in waveform monitor and vectorscope lets you monitor your video input and output.

ToasterKey—Use ToasterKey in Aura to paint in realtime on your video monitor. You can also paint in realtime over live video. Bring frames into Aura from a live input with the frame grabber.

Continuously Upgradeable —Guaranteed Against Obsolesence

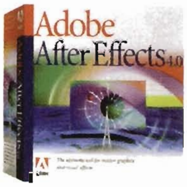
The Video Toaster was designed to last for years to come. Similar to the original Video Toaster for Amiga, which is still in production 10 years after its introduction, the Video Toaster utilizes a hardware system that leverages highly tuned software and the systems processor. The true power of the system comes from the proprietary software designed to create magic without the use of expensive video cards or bulky external hardware. By merging software and hardware, the Video Toaster can be upgraded and expanded well beyond current systems. NewTek will be adding modules for a real time 16-input switcher, DV I/O, storyboard editing, and ***real-time*** chroma keying and 3D DVE.

NewTek LightWave [6]
3D Animation, Modeling and Rendering Software



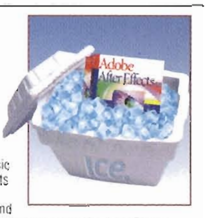
Explosive ideas that test the boundaries of 3D animation deserve a program that can realize them in exciting new ways. Creating worlds that no one's ever seen. Creatures that have never walked the Earth. Special effects, games, web sites - all creations that exist only in your mind. Until now............
The culmination of over ten years of development, LightWave [6] advances the state-of-the-art in professional 3D animation by adding a comprehensive set of groundbreaking character animation tools, advanced rendering capabilities, a new and improved architecture and a refined work environment. The three traditional areas of 3D, modeling, animating and rendering, have received massive enhancements in the new software. Among the thousands of changes in this completely redesigned system, LightWave [6] boasts real-time subdivision surfaces as a modeling and animation tool, radiosity, caustics, 160-bit floating-point rendering, a hybrid Inverse/Forward Kinematics engine and new character-animation technologies: LightWave, the recognized leader in the film and television industry, provides the most complete feature set of any 3D animation tool available—one of the reasons you can find LightWave 3D in more Hollywood animation suites than any other 3D program. And , LightWave [6] is the only 3D software system to run on Macintosh, Windows NT, Alpha and SGI.

After Effects
The Ultimate Tool for Motion Graphics and Visual Effects



Adobe The industry-standard for professional motion graphics, After Effects is the most powerful tool available for producing unlimited composites, fluid animations and sophisticated special effects. After Effects is also resolution independent (up to 4000 x 4000 pixels) so its the ideal design tool for film and video producers, graphic designers, multimedia professionals and Web developers. Produce stunning special effects for broadcast, film, video, multimedia, and on-line production right from your desktop. Create animations for openers, bumpers, on-air promos, commercials, music videos, titles, games, and more.
When compositing, After Effects produces results that meet even the most exacting standards. Control layers with stunning precision. Combine unlimited layers of moving and still images. Produce sophisticated audio and visual effects with more than 75 effects plug-ins. Create adjustment layers to apply effects to multiple layers simultaneously. Add any number of keyframes, animate and apply special effects to each layer, and adjust those layers until the composite looks and moves exactly the way you want. Enjoy precise control over every aspect of your composite-from sub-pixel positioning to controlling the shape and velocity of each animation path. Use the new RAM Preview function to check how compositions play back-in real time. Only when you are totally satisfied do you output a project for final delivery.
Available for Macintosh and Windows 98/NT, After Effects is tightly integrated with the Adobe product family, so if you work with Photoshop, Illustrator, and Premiere, you already have the skills, shortcut know-how, and hardware you need to make Adobe After Effects a seamless, powerful extension of your creative arsenal. When you import Photoshop files, After Effects preserves layers, alpha channels, and transfer modes-you can then animate each Photoshop layer over time. Imported Illustrator files remain in vector format until you output your final composition, so you can scale these graphics to any size while maintaining the crisp detail of the original artwork. After Effects and Premiere can import each other's movies.

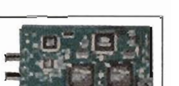
ICE.
After Effects on ICE
Motion Graphics and Visual Performanced Card



After Effects 'On Ice' provides blink-of-the-eye interactive responsiveness and lightning fast rendering across the entire application, not just with plug-in special effects filters. It gives users greater freedom to experiment in any compositing task, to perfect the right look, to complete more projects, and most important, to gain a vital edge. Along with a palette of awesome ICE effects, a must-have tool for After Effects users, AE on ICE adds performance where it is needed most — the core AE functionality of Geometrics, Compositing, and Motion Blur. So no matter if you are creating simple composites or intensive special-effects projects.

Basic Edition Includes Basic BlueICE board, After Effects Production Bundle, ICE'd After Effects Application and ICEfx —ICE's own award-winning tool set for After Effects. ultra Edition adds Ultra BlueICE hardware for the most powerful graphics perfomance available on the desktop.
It also includes an assortment of popular plug-in applications for After Effects These include an ICE'd DigiEffects CineLook, ICE'd Final Effects Complete and ICE'd Edges.
After Effects Ultra on ICE 5,995.00

Basic BlueICE/ Ultra BlueICE
Hardware Accelerator Cards for ICE'd Effects



The BlueICE video processing hardware Is the cornerstone for the ICE family of graphics-intensive visual effects and media compression tools. With four Phillips TriMedia 1300 processors, the Basic BlueICE card has a combined computer power that exceeds a workstation with multiple 400 MHz Pentium processors. When applications get "ICE'd" they take advantage of BlueICE's multi-processing hardware to achieve performance gains of 2x to 50x compared with un-ICE'd software. Visual effects are rendered faster and files are compressed faster.

- The Basic BlueICE board works in both Mac and Windows NT systems and includes an interface to support an optional BlueICE SDI video daughter card. Basic BlueICE is also field-upgradable to Ultra BlueICE with a simple snap-on duughter card
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HAIR OF THE DOG

A Sasquatch review

by
Jack "Deuce"
Bennett II

For years, finding a solution to growing hair on 3D objects has proven as elusive as the hirsute brute legend, Sasquatch. Finally, Worley Labs has claimed to have captured the bewhiskered biped and packaged his essence in a new fur and hair plugin for LightWave titled, of course, *Sasquatch*.

For LightWave versions 5.x and [6], Sasquatch embodies more than just a fur and hair plugin. With an amazing set of flexible controls that allows you to create stunning grass, porcupine quills, pine needles, or pom-poms; the possibilities are endless.

Since Sasquatch is a pixel filter, it makes fur with no need to create anything special; but long hair requires you to model "guides" in Modeler out of two-point polygon chains. Similar to Hypervoxels, no part of the Sasquatch work will show up as geometry. With its own level of anti-aliasing, Sasquatch rendering speed is almost as impressive as the profusion of control parameters provided in the interface.

At the Root

Sasquatch is essentially two filters. The displacement filter is applied to the surfaces of objects to "furrify" them. The pixel filter serves as the render engine. You find the displacement filter under the [Objects] -> [Deformations]->[Displacement Plugins] in Light Wave 5.x; and in [6], under the [Object Properties] -> [Deformations Tab] -> [Displacement Plugins]. In [6], unlimited instances of Sasquatch can be applied; in 5.x, you are limited to four.

The other half of Sasquatch is setup in the pixel filter panel located in 5.x under [Effects] -> [Image Processing] -> [Pixel Filter Plugins]; and in [6], [Settings] -> [Effects] -> [Processing] -> [Pixel Filter Plugins]. You only need one of the pixel filters running.

One other plugin, "Sasquatch Shadow" casts shadows onto other objects in your scene and is applied on a per surface basis. An additional displacement plugin, "Braid," also is included in the Sasquatch package.

Fur Command Central

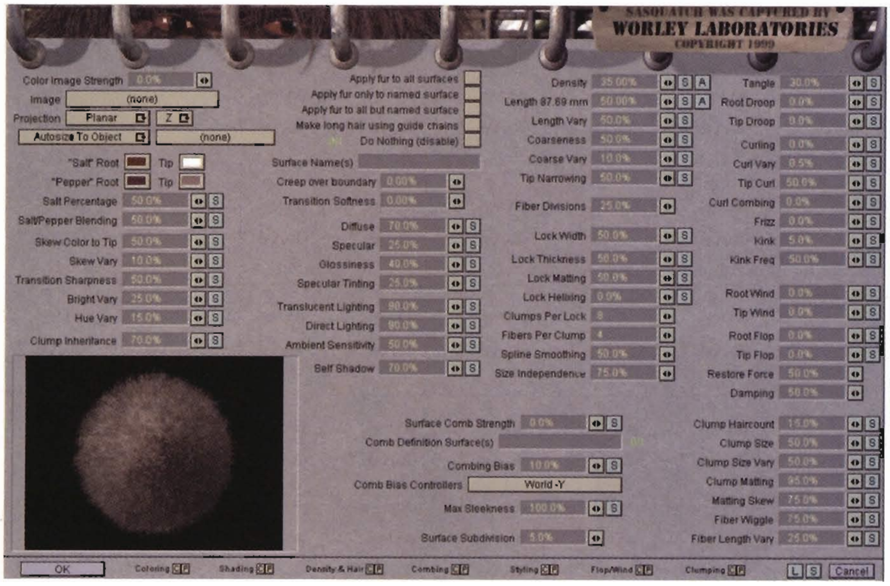
The displacement plugin contains Sasquatch's main panel of nearly seventy controls. From Hair Headquarters, you instruct Sasquatch where to grow fur, what it will look like, and what dynamic properties the fur will have.

At first, meeker animators may be aghast at the sheer number of controls. You MUST be running LightWave in at least 1024x768 resolution for this massive panel to open. (See Main Panel.)

Here you specify by name what surfaces will grow fur. You can use wildcards to grow on multiple surfaces, as well as using commas to separate surfaces.

Another control group colors the fur. You have four base colors, salt, pepper, root and tip, which are altered by settings such as blending, salt percentage, skew color, and hue variation.

You can dictate how the fur responds to light by setting diffuse and specularity values. Direct lighting, ambient sensitivity, and backlighting define how



Color Image Strength 0.0%
Image (none)
Projection Planar Z
Autosize To Object (none)
"Salt" Root Tip
"Pepper" Root Tip
Salt Percentage 50.0%
Salt/Pepper Blending 50.0%
Skew Color to Tip 50.0%
Skew Vary 10.0%
Transition Sharpness 50.0%
Bright Vary 25.0%
Hue Vary 15.0%
Clump Inheritance 70.0%
Apply fur to all surfaces ☐
Apply fur only to named surface ☐
Apply fur to all but named surface ☐
Make long hair using guide chains ☐
Do Nothing (disable) ☐
Surface Name(s)
Creep over boundary 0.00%
Transition Softness 0.00%
Diffuse 70.0%
Specular 25.0%
Glossiness 40.0%
Specular Tinting 25.0%
Translucent Lighting 90.0%
Direct Lighting 80.0%
Ambient Sensitivity 50.0%
Self Shadow 70.0%
Density 35.00%
Length 87.69 mm 50.00%
Length Vary 50.0%
Coarseness 50.0%
Coarse Vary 10.0%
Tip Narrowing 50.0%
Fiber Divisions 25.0%
Lock Width 50.0%
Lock Thickness 50.0%
Lock Matting 50.0%
Lock Helixing 0.0%
Clumps Per Lock 8
Fibers Per Clump 4
Spline Smoothing 50.0%
Size Independence 75.0%
Tangle 30.0%
Root Droop 0.0%
Tip Droop 0.0%
Curling 0.0%
Curl Vary 0.5%
Tip Curl 50.0%
Curl Combing 0.0%
Frizz 0.0%
Kink 5.0%
Kink Freq 50.0%
Root Wind 0.0%
Tip Wind 0.0%
Root Flop 0.0%
Tip Flop 0.0%
Restore Force 50.0%
Damping 50.0%
Surface Comb Strength 0.0%
Comb Definition Surface(s)
Combing Bias 10.0%
Comb Bias Controllers World -Y
Max Sleekness 100.0%
Surface Subdivision 5.0%
Clump Haircount 15.0%
Clump Size 50.0%
Clump Size Vary 50.0%
Clump Matting 95.0%
Matting Skew 75.0%
Fiber Wiggle 75.0%
Fiber Length Vary 25.0%

Main Panel

the fur responds to the lights that you set in layout.

Both color and the lighting can be adjusted with fast feedback in the interface's window. When you activate "preview mode" and render, a real-time (well, pretty darn fast) updated image will show changes made to the color and lighting controls, except for direct lighting (much like VIPER in LW [6]).

To tailor the look of the fur, you adjust density, length, coarseness and tip narrowing. Density is the amount of fur that covers the surface, length is the length of the fibers, coarseness is the size of the fibers, and tip narrowing is the sharpness of the fiber point.

Fiber divisions set the "resolution" of the fibers. The fibers are created like a two-point polygon chain is made, and increasing the value of the fiber divisions increases the smoothness of the curves of the fiber.

With styling controls, you set curling, frizz, tangle, kinkiness, tip and root drooping of the fibers.

Motion dynamics are set on a tip/root separation, which allows you to specify an apparent stiffness of the fiber. Fibers with a low root flop, and a high tip flop will seem to be stiff in the shaft of the fiber. Longer fur really benefits from the ability to respond to movements of the object or wind. (Note: currently, Sasquatch can only read the physical movement of the object. Motion dynamics do not respond to surface movement created by bones, displacement maps, or any method of moving the points without physically moving them.)

Clumping influences the grouping of fibers. To visualize this, imagine a wet dog. His fur has many clumps with many fibers. As he dries off, the clumps become smaller involving fewer fibers.

Combing can be done with "smart combing" or with nulls. Smart combing uses a surface to start the comb from the edges of that surface and it follows the contours of the surrounding body. Most animals can have the base coat of fur styled in this method very quickly. With multiple combing nulls, you can blend the influence over an area. The null's size controls the blending strength. (The nulls are read at frame zero and frozen.) Very intricate combing is possible by combining the two methods.

Clicking on the little "S" button next to most of the controls opens the "S Panel," where you can modify the setting with an image map, fractal noise, fractal spots, null effectors, and slope. This singular panel brings a whole new dimension to the controls for creating fur.

You can animate density and length - can you howl "Werewolf"? The other controls would "pop fibers" if they were animated.

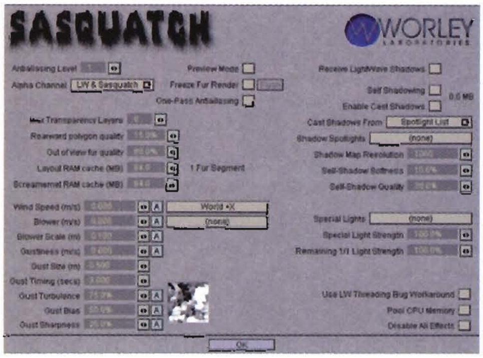
Pixel Peach Fuzz

In the pixel filter, the rendering engine of Sasquatch, you set memory allocation for rendering, the level of anti-aliasing, shadow casting, global wind and localized blower controls. (See PixelPanel.) The panel also indicates how many rendering passes are required. You can set "one pass" anti-aliasing; but for computing LW motion blur, you need to turn this off.

Sasquatch can exist in the alpha channel, which is very handy for compositing. You can have the alpha channel contain just the objects, the objects and the fur, or just the fur.

The light controls remind many people of Gaffer (another Worley Labs plugin). You can specify what lights to use for the calculation of the shadows, and even boost or cut a light's influence on the fur. In the Pixel Panel, you also decide whether the fur casts shadows, self shadows, or doesn't have shadows.

Setting the wind generator controls to global, affects all the fur in the entire scene. With "blowers," you can affect fur on a more local basis. Both of these controls are assignable to nulls, and can be animated over time. A preview window is activated when wind turbulence is turned on, allowing you to adjust the wind in real time.



Antialiasing Level
Alpha Channel LW & Sasquatch
Preview Mode ☐
Freeze Fur Render ☐
One-Pass Antialiasing ☐
Max Transparency Layers
Rearward polygon quality
Out of view fur quality
Layout RAM cache (MB)
Screamernet RAM cache (MB)
1 Fur Segment
Wind Speed (m/s) World +X
Blower (m/s) (none)
Blower Scale (m)
Gustiness (m/s)
Gust Size (m)
Gust Timing (secs)
Gust Turbulence
Gust Bias
Gust Sharpness
Receive LightWave Shadows ☐
Self Shadowing ☐
Enable Cast Shadows ☐
0.0 MB
Cast Shadows From Spotlight List
Shadow Spotlights (none)
Shadow Map Resolution
Self-Shadow Softness
Self-Shadow Quality
Special Lights (none)
Special Light Strength
Remaining 1/1 Light Strength
Use LW Threading Bug Workaround ☐
Pool CPU Memory ☐
Disable All Effects ☐

PixelPanel

A Fleeting View

We have just scratched the surface of this amazing plugin. For further information, visit www.worley.com. The price listed for Sasquatch is $499.

If you have any questions, feel free to email me. Also, I have produced a video manual for Sasquatch and am currently working on a tutorial video. Details can be found at www.cimagineering.com. Happy rendering!

Jack "Deuce" Bennett II runs Creative Imagineering, Inc. with his father and produces the on-screen graphics for Walker, Texas Ranger. Also a freelance 3D artist, you can contact him at deuce@cimagineering.com.

A CLOSER LOOK AT IK

A project:messiah Tutorial

by
Ron Griswold

Before deciding on a topic for this tutorial on project:messiah, I took a look back through the archives on the mailing list (see www.egroups.com/group/sxsmessiah for details) for common perplexing problems. IK (inverse kinematics) topped the list - not surprisingly since virtually all character setups involve IK.

Of the three main types of IK: 3D, 2D and telescopic, we are concerned only with 2D in this article. Typically when dealing with characters, 2D is most well suited for animating limbs.

In 2D IK, the first object in the IK chain is called the anchor. It solves on 2 axes, heading and pitch (rotation about the Y and X axes respectively). All other joints in the chain only solve on pitch. The last object in the chain is called the "end effector," and the object that controls the IK chain is named the "goal." When a solution to the IK system is achieved, the end effector and the goal will be in the same place.

Project: messiah™
Advanced Animation System

One of the advantages of 2D IK is its speed. With 3D IK, many solutions exist for each position of the goal object. The more constraints placed on the system, the more possible solutions we can throw away. By limiting the chain to a plane, which is what 2D IK does (Figure 1), we greatly reduce the number of possible solutions.

In project:messiah, let's look at a 2D IK example with a leg and see what kind of problems we encounter.

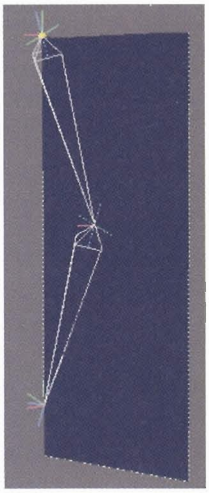


Figure 1

1. Create 5 nulls with the following names and hierarchy (see the project:messiah docs if you are not familiar with how to do this):

Leg
|_Thigh
| |_Knee
| |_Ankle
|_Goal

2. Move "Knee" and "Ankle" each to <0,0,1>. This is important. Messiah prefers the IK chain to run down the positive Z axis. The value of 1 for each of the Z values is arbitrary, change these numbers to fit your character. Also, move "Goal" to approximately the same position as the Ankle, this does not need to be precise.

3. Now rotate the "Thigh" and "Knee" to a slightly bent but vertical position (Figure 2). (NOTE: I have parented bones to the "Thigh" and "Knee," this is just to make the leg easier to visualize in the Figures, they do not perform any function.)

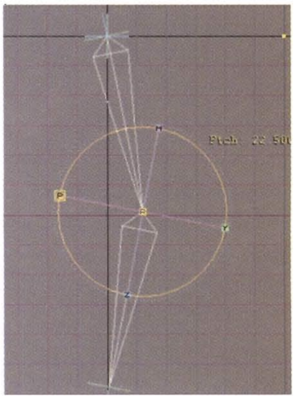


Figure 2

4. Now define the IK chain, select "Thigh" and go to the Animate->IK tab and check "Anchor." Then select the end effector, "Ankle," and again go to Animate->IK and choose "Goal" as the goal object. Before leaving this tab, check "Calculate IK" to activate the IK solver.

Play with this IK chain by moving the goal around. Also rotate "Thigh" on its bank to see how that affects the chain. Notice that the leg will flip when the goal is moved beyond a certain point. This flip happens because the IK solver makes certain assumptions that work fine if this chain were an arm, for example; but since it's a leg, we want it to behave differently. To change the behavior, we must take more control over the solver in messiah. With this extra control comes extra responsibility as well - we must tell solver exactly what we want.

Remember earlier we discovered that 2D IK locks the chain to a plane; but that plane is free to rotate. The first step (don't do this just yet, you'll see why in a bit) in gaining more control over the solver is to constrain that plane to the rotation we assign it, rather than letting it decide for itself what that rotation will be. We do this by adding an expression with the function KneeConstraint(). The "()" at the end of the name indicates that this is a function.

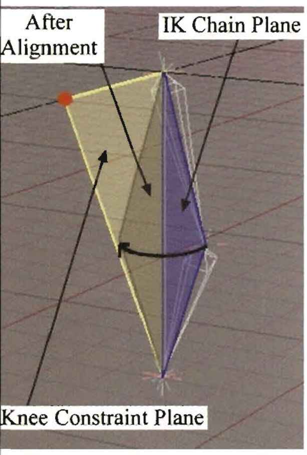


Figure 3

KneeConstraint() rotates the first object in the IK chain so that the plane that it is on is aligned with the plane defined by the three objects listed as arguments to the function (Figure 3). The red dot in the image is a placeholder for the Knee_Constraint null that we will create in a later step. (NOTE: There is an object that IS a Knee Constraint, which is turned into the Knee Constraint by the KneeConstraint() function. We will call this Knee Constraint object: "Knee_Constraint." Don't get Knee_Constraint and KneeConstraint() confused. Remember that the "()" at the end of anything indicates that it is a function. I know it sounds a little confusing at first, but it is no different than calling a goal object: "goal.")

Before we actually create the function, KneeConstraint(), let's discuss its traits. To visualize when the IK chain will flip, think of the plane that the KneeConstraint() function creates as a polygon. KneeConstraint() uses the positions of three objects to define the plane. Imagine these are points in Modeler and you are making a polygon. If you select the points in a clockwise direction, the surface normal will point toward you; if you select them counterclock wise, the normal will point away from you. If you move one of the points in the polygon so that it crosses the line between the other two points, you have effectively changed the direction the points were selected - from CW to CCW (Figure 4). Thus the normal of the polygon flips. The IK chain also flips at the same point. If the goal object is moved up past the line between the knee constraint object and the thigh the chain will flip. Note that this is a line, not a line segment, the chain will flip if it crosses the line on the other side as well.

We can prevent the goal from ever being able to cross that line if the Knee_Constraint object were to rotate around the thigh as the goal object is moved (Figure 5).

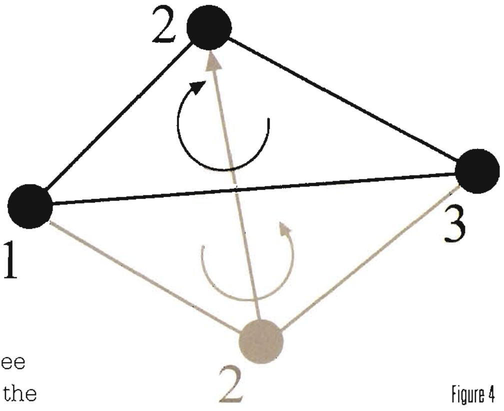


Figure 4

We'll use another function to control this rotation called AlignTriAbs(). This function is similar to KneeConstraint() because it too uses a plane defined by three objects to perform some task. In this case, a fourth object is added, which will be positioned and rotated to some point on the plane by the expression. We're not really concerned with moving the object on this plane, what we're concerned with is the rotation. We'll use this object like a surface normal.

To see how this theory works, let's start building this mechanism. Remember, we haven't created the knee constraint yet, so if you've skipped ahead and created one, get rid of it. We're not there yet.

4. Create 4 nulls; name them and place them into the hierarchy as listed below (bold names are the new ones):

Leg
|_Thigh
| |_Knee
| |_Ankle
|_**Side_Vector**
|_**Knee_Align**
| |_**Knee_Adjust**
| |_**Knee_Constraint**
|_Goal

5. Translate Side_Vector to <1,0,0> and Knee_Constraint to <0,1,0>.

6. Change Knee_Constraint's shading mode to "Line." This is done by repeatedly clicking on the box with the letters in it, next to the item in the item list. Keep clicking until the letter is: "L."

7. Create the following expression [Command tab, new expression button]:

Name:Knee_Align_exp
Exp: AlignTriAbs(Thigh, Goal, Side_Vector, Knee_Align, 0,0,0,0)

The four objects listed in this function are the three objects that define the plane, followed by the object to be aligned. The last four arguments, the "floats," are the U, V, position fader, and rotation fader parameters. (A "float" refers to the floating point data type - basically any number that has a decimal in it. NOTE: that any integer can be used as a float since a ".0" can be added to the end, this does not work the other way around though). The U and V values position the object on the plane defined by the first three objects relative to the first object. Since our first object is at the hip a U and V value of 0 will position our object at the hip. The last two are the faders to fade out the effect of this expression, in this case we always want the expression to affect the object, therefore they also will always be 0.

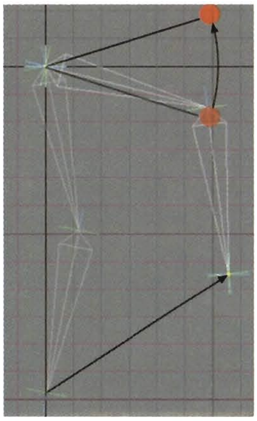


Figure 5

Go to a side view and move the goal object around. If you imagine a line being drawn from the Thigh's pivot point to the goal object, then you can see that the yellow line from the Thigh to the Knee_Constraint remains perpendicular to it. Try to make the goal cross the yellow line; you can't do it.

You may be wondering why the leg still flips. Well we haven't actually hooked up the KneeConstraint() expression yet. So go back to the Command tab and add a new expression:

8. Add the following:

Name:Knee_Constraint_exp
Exp: KneeConstraint(Thigh, Knee_Constraint, Goal, 0)

The three objects in this function are the same as the first three in the AlignTriAbs() function, they define the plane. The last integer should generally always be 0. This is one of the first functions that was added to messiah; and in this case, the integers represent 0 = heading; 1 = pitch; 2 = bank. For backward compatibility, this function has not changed to the channel data type. But you will almost never use a value other than 0, so don't worry about it.

You have constructed a rock solid IK leg. The only place where this leg is unstable is when the Goal is brought very close to the Anchor (Thigh). This "critical zone" is unavoidable and is a familiar problem in all known implementations of IK.

Let's quickly go back through what we've done. First we created a standard IK leg (often the extent to which the average character setup goes). We've taken it a few steps further though, by controlling how the IK system will solve.

In this two-step process, first we created a mechanism, AlignTriAbs(), that rotated as a function of the translation of the goal object. We translated the null, Knee_Constraint, to <0,1,0> because AlignTriAbs() rotates the object it is effecting so that its positive Y axis is pointing in the direction of the normal belonging to the plane defined by the first three objects. Sounds pretty crazy, huh? Just imagine a triangle created by the first three objects in the AlignTriAbs() function. Now imagine the surface normal of that triangle, the fourth object's positive Y axis will be pointing in that direction.

The second step was to create the KneeConstraint() expression. This used the null, Knee_Constraint, that is being rotated by the AlignTriAbs() function as one of it's three input objects. This function aligned the plane defined by the Thigh, Knee, and Ankle to the plane defined by the Thigh, Goal, and Knee_Constraint, by rotating the Thigh.

In the finished product, you have just two controls that you will actually animate, Goal and Knee_Adjust. Goal is straightforward and familiar. Knee_Adjust should be rotated on its pitch only. You can hide all of the other channels in the edit sphere by right clicking on the colored box next to the channel letter under the Animate tab.

As an alternative, you can translate Knee_Constraint directly instead of rotating Knee_Adjust on its pitch. This may be a more familiar method to LightWave 3D users who use an extra goal object to rotate the knee.

You may be asking yourself: "why doesn't messiah just do that for me?" By default messiah makes certain assumptions that work very well for a general case. Here we addressed a specific example, with specific needs. Messiah's power lies in its ability to allow the user to change the way it works. With two simple expressions, we changed the behavior of something as complex as IK!

Do some experimenting with this setup and see if you can add to its functionality. Maybe add a foot. Might I suggest the "Reverse Foot" setup.

Ron Griswold is the lead Character TD (technical director) with pmG. You can find him on the messiah mailing list or at ron@projectmessiah.com

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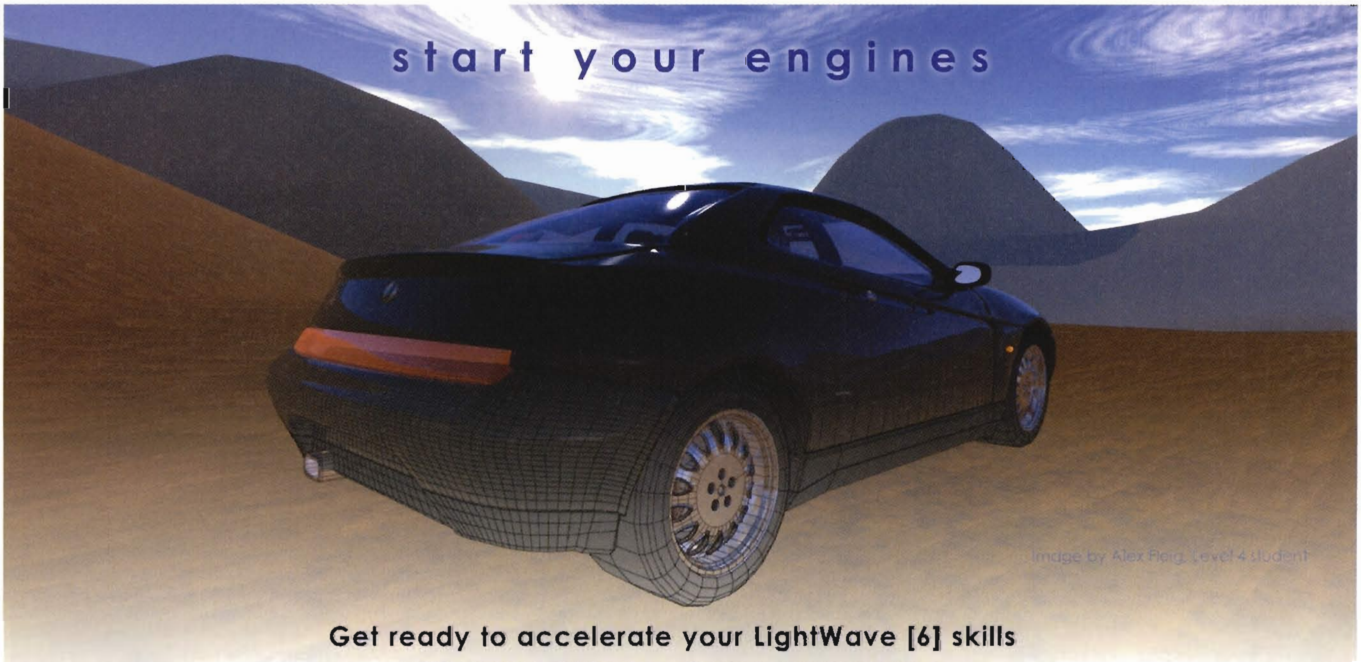

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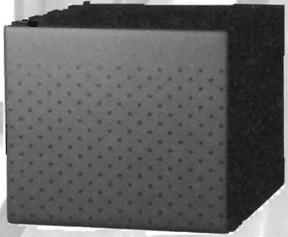

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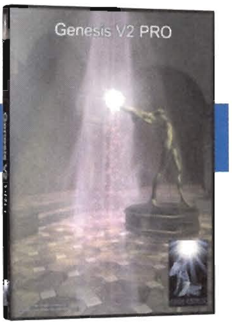
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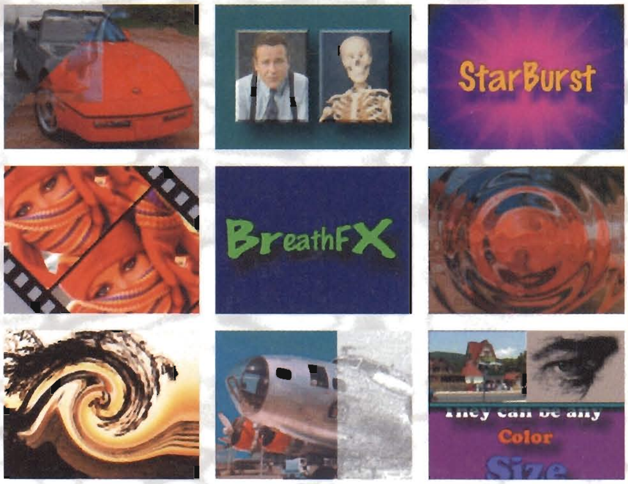
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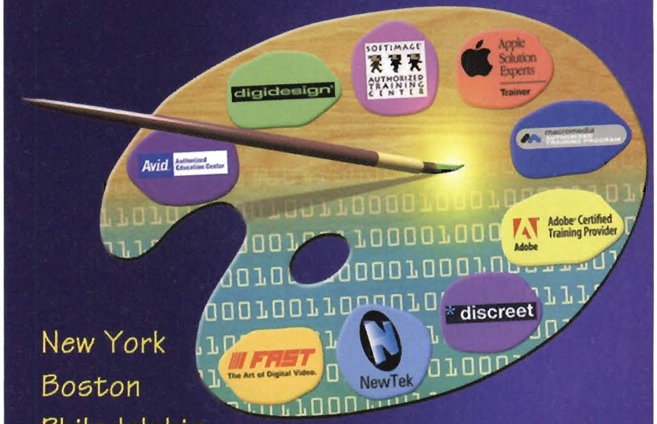
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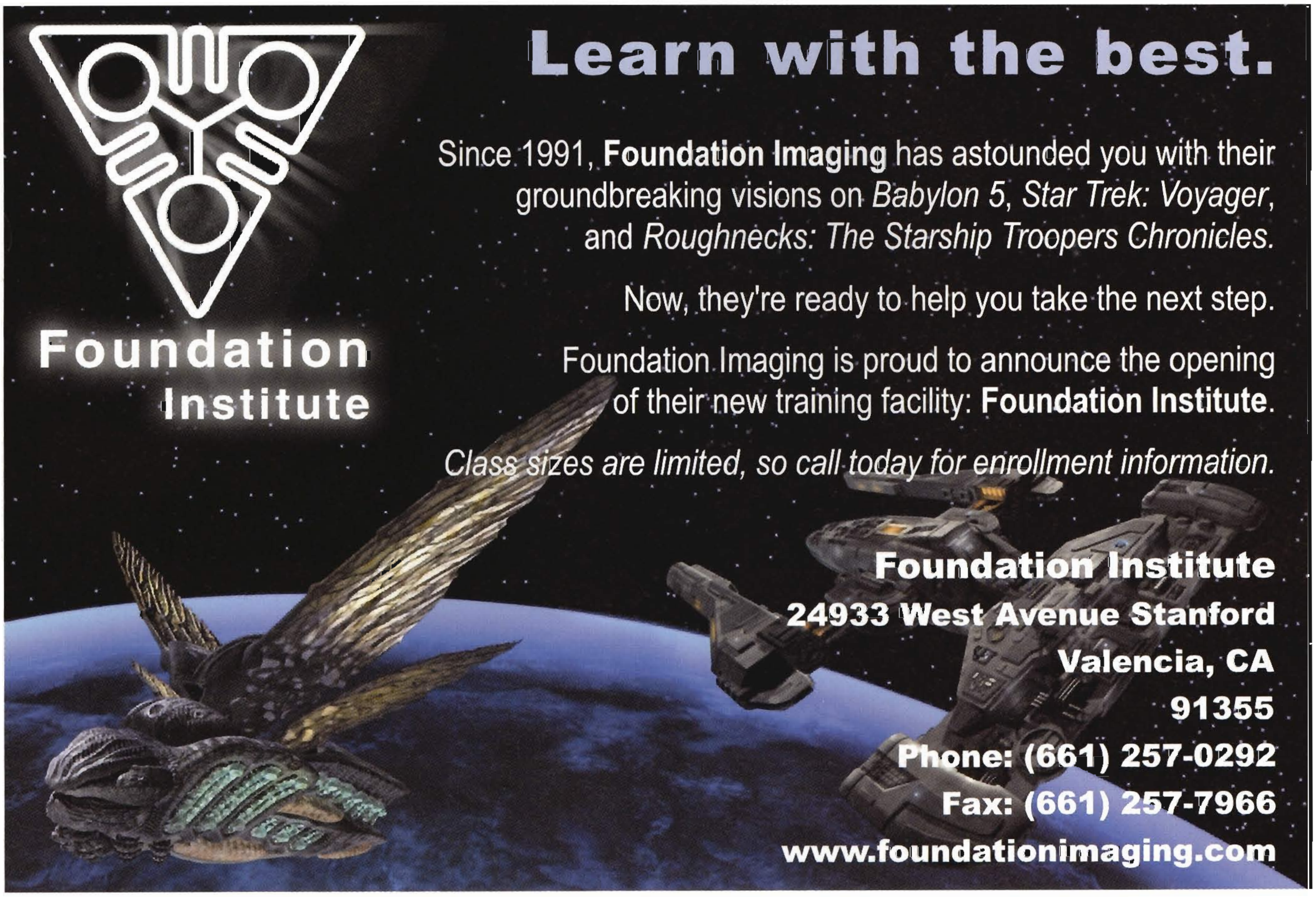

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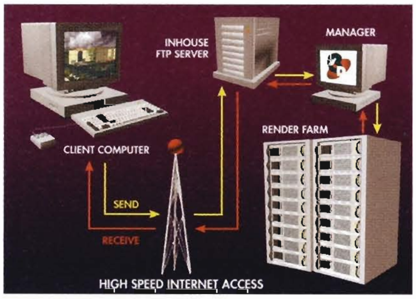

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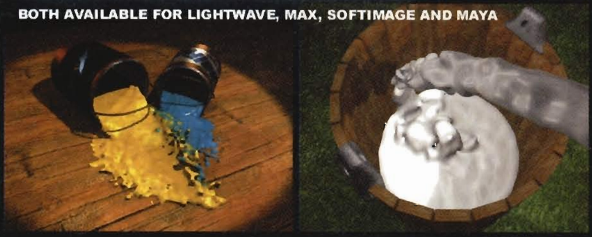

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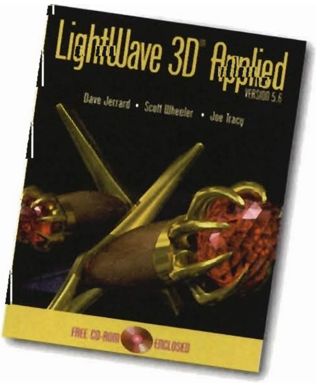

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Don't Even THINK About It

The Crime of Digital Tinkering

Not too long ago, an ingenious Linux user in the Netherlands had a problem. He owned a PC with a DVD-ROM drive, but he couldn't watch movies on it because no one had bothered to write a DVD player for Linux. So, he rolled up his sleeves, examined a few Windows DVD players, and wrote his own player. Hooray for ingenuity! Little did he know that he would soon be arrested - and the ramifications of his resourcefulness would continue to reverberate a year later in a battle in a New York City courtroom.

Widely known as the "DVD Trial," the plaintiffs were Universal Studios, Paramount Pictures, 20th Century Fox, Columbia Tri-Star and every other major motion picture studio in the country. The defendant? Emmanuel Goldstein, publisher of *2600 Magazine*. A relatively small publication, *2600* probably is read by about as many people as the one you're holding now. So what could this veritable hot dog stand of an organization do to incur the wrath of the most powerful conglomerates on the planet? Simple – they published a tiny computer program.

No, it wasn't a virus. Nor a worm. Not even an email rant against movie studios. It was called DeCSS, and it was designed to get around the CSS encryption of a DVD, allowing DVDs to be played on nearly anything that would accept the disc. Well, the studios didn't like this one bit because the program (which could also be used to make perfect digital copies of DVDs) was being distributed over the Internet. So the studios huffed and they puffed and they served injunctions against all the websites they could find that posted the program, including *2600.com*, who gladly complied with the court order and took the program down. However, the order didn't prohibit posting links to *other* sites where DeCSS could be found, so that's exactly what *2600.com* did.

Well, the movie studios didn't like that either, so they dragged *2600* into court to contest the legality of not only the program, but of even telling anyone where you could find it. Sounding suspiciously like an encroachment on free speech, the good folks at EFF (the Electronic Frontier Foundation, an electronic civil liberties group largely responsible for our right to surf an uncensored Internet) stepped in to provide legal counsel. After all, what had Goldstein really done? Did he pirate DVDs? No. In fact, no evidence exists that anyone had *ever* used DeCSS to clone movies. But since it *could* be used for that purpose, and since he was telling people how to find it, he had to be stopped. Emmanuel Goldstein lost. The judge declared that DeCSS was illegal and that even linking to it was against the law. You see, this case was the first ever to be prosecuted under the Digital Millennium Copyright Act, (DMCA), which outlaws reverse engineering technology that could defeat a copyright.

We all lost. As a techno-junkie, I find it frightening that the government is trying to tell me that I can't tinker with the legal toys I have legally purchased however I see fit. Just the fact that something *could* be used for nefarious purposes shouldn't be enough to make it illegal. The computer I'm typing this on *could* be used to send a virus, so should it be taken away? The magazine you're holding *could* be rolled up and used to bludgeon someone, so should that be confiscated too?

As high-tech artists, it's critical for each one of us to be cognizant of our technological future and play a role in shaping it. Information is power, and we as members of a free society need to ensure the unfettered flow of that power. Check out 2600.com and EFF.org for the latest on the DVD trial's appeal and to learn more about vital electronic issues. In the meantime, take *2600's* lead and publish a text file that simply lists the sites that currently offer DeCSS – or buy a T-Shirt at Copyleft.net *(Ed. Note: Copyleft.net also has been subpoenaed)* that displays the source code of the program! These things aren't illegal – *yet.*

Mojo, a Visual Effects Supervisor at Foundation Imaging, received an Emmy for his work on *Star Trek: Voyager* and can be reached at mojo@foundation-i.com.

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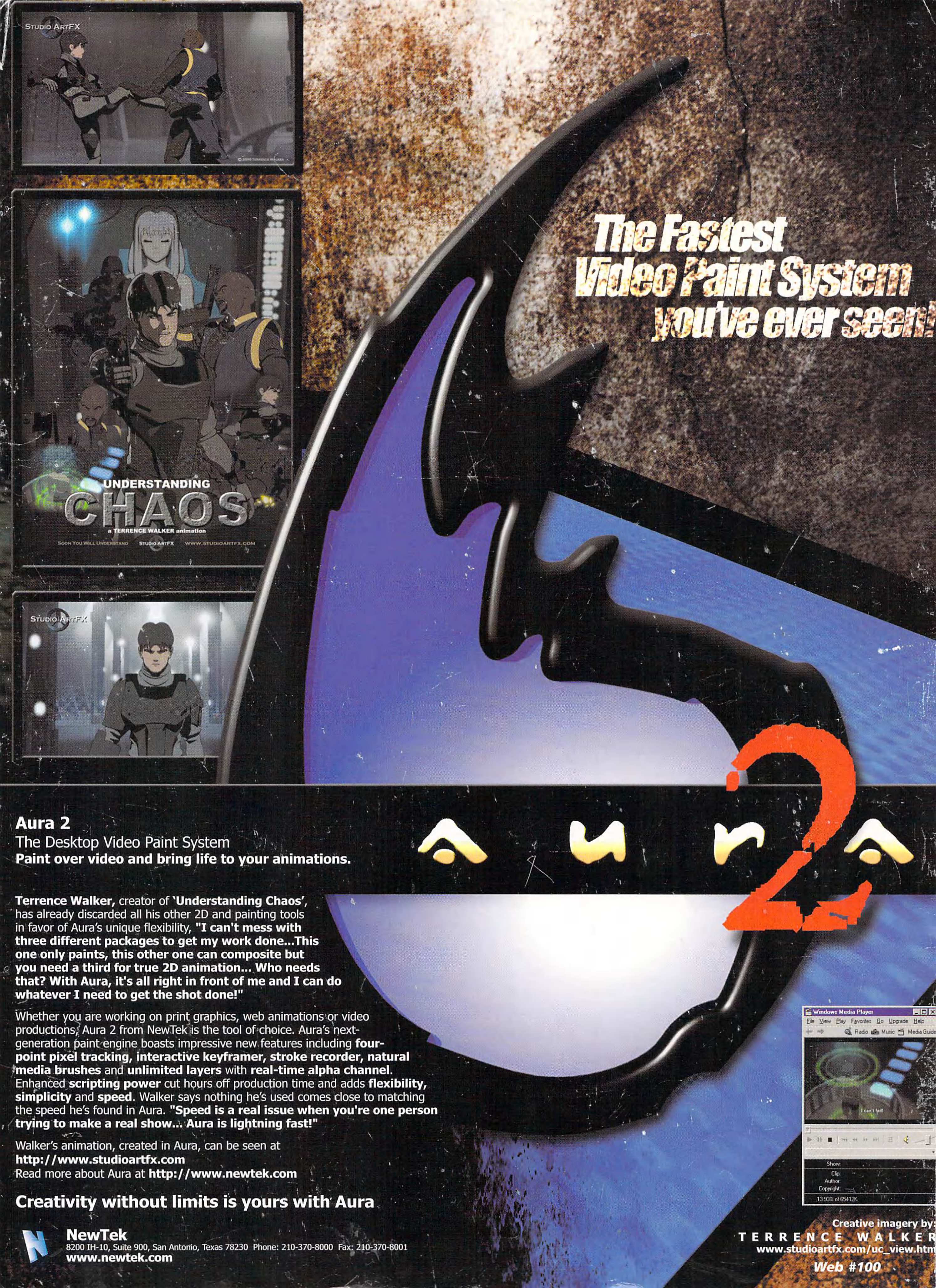
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Walker's animation, created in Aura, can be seen at
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